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Potential Economic Effects of Experience-Rating the Unemployment Insurance System Using a Multi-Sector General Equilibrium Model of Canada

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ABSTRACT

In considering the effects of the Canadian unemployment insurance system, much effort has been devoted toward describing and estimating how the provision of benefits distorts the labour supply decisions of individuals.

This paper takes a different tack: its premise is that the main distortionary effects of UI are due to the lack of correspondence between benefit payments and premium charges within a firm or industry, and not benefits in themselves. Moreover, the effect of UI is to distort the equilibrium level of output and labour supply and demand across industries, rather than just affecting the supply decisions of individuals. Establishing a correspondence between benefit payments and premium charges would eliminate these distortions. This paper estimates the effect of doing this by experience-rating premiums at the firm level; however, experience-rating employee premiums or implementing an "intensity rule" as proposed in the latest UI reform would have a similar effect.

Experience-rating is modelled by introducing stochastic labour demand and unemployment into a 95 sector general equilibrium model of the Canadian economy. The effects of UI benefits and premium charges are modelled in a manner consistent with optimal contract theory, where UI increases the cyclical volatility of unemployment. Findings indicate that experience-rating UI has the potential to increase GDP 2.2 percent and to reduce unemployment 2.2 percentage points.

RÉSUMÉ

Les efforts concernant l'analyse des effets du système canadien d'assurance-chômage ont surtout porté sur la description et l'estimation de l'impact des bénéfices sur l'offre de travail des individus.

La présente étude prend une approche différente: elle part de l'hypothèse que la principale cause d'inefficacité économique de l'assurance-chômage n'est pas le niveau des bénéfices mais plutôt l'absence de relation entre les bénéfices et les contributions au niveau des firmes ou des industries. De plus, l'effet de l'assurance-chômage est de modifier l'équilibre intersectoriel de l'offre et de la demande tant du travail que des produits, et non seulement l'offre de travail. L'établissement d'une relation entre les bénéfices et les contributions éliminerait ces distorsions. Cette étude estime les effets d'établir cette relation en s'assurant que les primes payées par les firmes couvrent les bénéfices associés à leurs mises à pied: cependant, cette relation pourrait être établie au niveau des individus ou par une règle d'intensité telle que proposée dans la dernière réforme de l'assurance-chômage tout en obtenant des effets similaires.

L'instauration des primes en fonction des bénéfices est simulée en utilisant un modèle d'équilibre général du Canada à 95 secteurs. Le modèle incorpore une demande de travail stochastique ainsi que du chômage. Le traitement des bénéfices et des primes associés à l'assurance-chômage est cohérent avec la théorie des contrats implicites selon laquelle l'assurance-chômage augmente la volatilité cyclique du chômage. Les résultats indiquent que l'établissement des primes en fonction des bénéfices pourrait augmenter le PIB de 2.2 pourcent et réduire le chômage de 2.2 points de pourcentage.

1. INTRODUCTION

All OECD countries spend considerable sums of money on unemployment insurance (UI) programs of one kind or another. Canada, for example, operates a program which spends $15.5 billion or 2.1 per cent of GDP[1]. Given the large size of the UI programs relative to the economies of many OECD countries, it is important to understand how these programs affect economic performance. One perspective on such effects is provided in the determination of UI's impact on the non-accelerating-inflation rate of unemployment (NAIRU). A number of studies have shown UI's strong impact on the NAIRU in Canada[2]. However, such NAIRU studies, while capturing an important aspect of labour market performance, do not provide the full impact of the effects of UI on economic performance.

An important element of the unemployment insurance program that could affect economic performance is whether or not such a program is experience-rated. Experience-rating implies that, at the margin, a more intensive use of the system would imply a larger cost. This larger cost could be charged to either workers or firms. While these two alternative ways of experience-rating may not be exactly the same, they are likely to have considerable overlap. An example of the first kind is the proposed "intensity" test in the latest Canadian reform proposals announced in December 1995. An example of the latter is the firm-level experience-rating in the United States.

Except for the United States, which has a partially experience-rated UI system, and the recent Canadian proposed reform, no other OECD country has adopted a premium structure where UI contributions paid are related to layoff history[3]. The absence of experience-rating generates *ex ante* net transfers among workers and firms. While the significance of such transfers would differ from country to country, Corak and Pyper (1994) demonstrate they were large in Canada in the absence of experience-rating. These transfers are expected to act like any other distorting taxes and subsidies: they must, therefore, have allocative efficiency effects in addition to the effects of the UI on the NAIRU. What is more important, the allocative efficiency effects and the NAIRU effects of UI must be a joint outcome of the maximisation behaviour of

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1 Canadian figure for 1994. See OECD (1991) for a detailed review of the UI programs in OECD countries. OECD (1994) provides an update of spending on UI in the OECD countries.

2 Important Canadian studies include Coe (1990), Burns (1990), Card and Riddell (1993), Fortin (1989), Keil and Symons (1990).

3 Albeit, Sweden operated an experimental experience-rated system during the late 1950s and early 1960s.

firms and workers. Despite the potential importance of these effects, given the large relative sizes of UI programs and evidence on the significance of NAIRU impacts, there is not a single study of any UI program in any OECD country which either captures the economy-wide allocative efficiency effects, or the inter-active allocative efficiency-unemployment effects, of the non-experience-rating characteristic of their UI programs. This study is the first of its kind and fills an important gap in the UI literature.

What has been available on the empirical front in the past two decades is a number of empirical studies of the U.S. labour market that have estimated the impact of experience-rating on unemployment. These studies have examined how incremental differences in the degree of experience-rating affect labour market turnover and unemployment. If their results are extrapolated to consider the impact of fully experience-rating a non-experience-rated UI system they suggest that temporary lay-off unemployment would fall almost 60[4] per cent and total unemployment about 25 per cent. A recent examination of the effect of experience-rating in the retail sector, Anderson (1994), also found that experience-rating increases employment. These studies, however, provide only an incomplete picture. Their estimates are derived using a partial-equilibrium framework, which cannot consider indirect effects of experience-rating through its influence on wage costs, the inter-industry allocation of labour, or aggregate employment. Nor do these studies consider the effects of UI on the allocation of production across sectors and thus aggregate output. Naturally, the interaction of allocative efficiency and employment/unemployment effects are left out given these problems.

The main contribution of this paper is the development of a 95 sector general equilibrium model of the Canadian economy. Such a large and detailed sectoral model is required if we want to understand the sectoral allocative efficiency effects of an economic policy change. As argued above, experience-rating unemployment insurance on the firm or worker side are broadly similar. We have chosen to model the effects of experience-rating on the firm side as it demonstrates the links between unemployment, UI benefit use and the structure of UI premiums in a more straightforward manner. It is easier to model, and it also more fully captures the potential benefits from undertaking such a reform.

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[4] Temporarily unemployed workers are those who return to their previous employers. They comprise a significant portion of unemployment: studies by Corak (1994) and Robertson (1989) find that temporary unemployment accounts for between 37% and 44% of UI benefit use, and likely a similar portion of unemployment.

Labour market behaviour in our model is incorporated using an optimal-contract framework, similar to that described in Feldstein (1976) and Topel and Welch (1981). This framework assumes that a firm's labour demand is stochastic, fluctuating discretely between high- and low-demand states. Firms' human resource decisions involve determining the optimal number of workers contracted to meet labour demand in the "high" state, and how many to layoff in the "low" state. This feature of the model allows us to capture the cyclical and seasonal swings in the economy that create unemployment and provide the *raison d'être* for a UI system.

This model, to our knowledge, is the first of its kind. Static general equilibrium models, and partial labour market models exist, but they do not interact. We have developed a large general equilibrium model that builds in economic cycles and a fully developed labour market: that is the only way one can understand the complex interactions that a Canadian-style UI program creates and the only means of getting a handle on its impact on the performance of the Canadian economy.

The plan of the paper is as follows. Section 2 provides a brief description of the existing Canadian UI system (before the proposed changes announced in December 1995) and gives information on its net inter-industry transfers. A review of the empirical literature on the effects of experience-rating is discussed in Section 3. This is followed, in Section 4, by a detailed discussion of our modelling methodology and data and calibration issues. Section 5 provides estimates of the potential gains to the Canadian economy of an experience-rated system. We need to emphasise that these estimates do not, in any way, suggest the extent to which the gains are realisable, as the paper ignores the administrative complexities and costs of implementing an experience-rated system. In addition, while the analysis is conducted in a firm-level experience-rating framework, a part of the gain should be realisable if experience-rating is introduced on the worker side, such as in the "intensity" rules in the latest Canadian UI reform proposals. Finally, Section 6 provides concluding remarks.

2. THE EXISTING CANADIAN UNEMPLOYMENT INSURANCE SYSTEM

Canadian UI expenditures were $15.5 billion, or 2.10 per cent of GDP, in 1994. About 92 per cent of the paid work force was eligible for benefits. In addition to providing income support for unemployed workers, which accounted for 80 per cent of expenditures, UI also provided funds for active labour market programs, such as

training and self-employment assistance, and sickness, maternity and parental leave benefits.

The UI program, and its administrative costs, are funded entirely through a flat rate payroll tax levied on employees and employers. The statutory incidence of the tax is divided in a 58/42 proportion between employers and workers. What is most critical from our perspective is that premiums are invariant to an employer's layoff history, although the aggregate flat tax rate is adjusted to ensure that revenues and expenditures balance in the "long-run". The government has some discretion in determining premium rates within a set of guidelines and a statutory premium rate is established using a 3-year moving average of UI expenditures. If the UI account is in surplus, the actual rate must be less than or equal to the statutory rate and vice versa.

2.1 Inter-industry transfers created by unemployment insurance

The effect of the non-experience-rating characteristic of the UI can be illustrated by looking at net taxes paid by some, and net subsidies, received by others. The size of these *ex ante* transfers is critical in determining the extent of the effects of the program on the Canadian economy. Unfortunately, it is not possible to determine the size of the *ex ante* transfers. What is presented here is *ex post* transfers. However, we use averages of *ex post* transfers over several years, which should be a reasonably good indicator of the *ex ante* transfers.

Figure 1:
Net benefits as a per cent of wages, 1986 to 1989

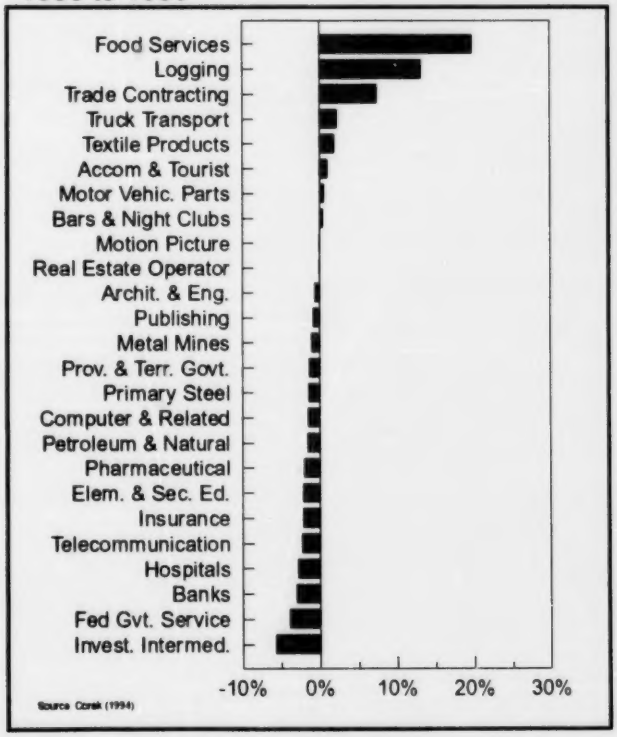


Figure 1 depicts net UI benefits as a percentage of wages for selected broad industries over 1986 to 1989. Net benefits are the differences between benefit payments and premium revenues within an industry, adjusted so that UI premiums and benefits balance in aggregate. As can be seen, UI transfers range from

providing a net subsidy of over 20 per cent of wages to the food services industry to imposing a net tax of just over 5 per cent of wages on the investment intermediary industry. The data provided in Figure 1 are derived from Corak and Pyper (1994) who consider the pattern of inter-industry subsidies using a 275-industry break-down for the 1986 to 1989 period.

In addition to being large, inter-industry subsidies created by UI are also persistent, which is indicative of the *ex ante* nature of these transfers. Corak and Pyper compare their results to Karagiannis (1986), who undertake a similar analysis for the 1975 to 1982 period, and find that virtually every industry that was a net beneficiary during the 1975-82 period was also a net beneficiary in the 1986-90 period.

Figure 2:
Industry distribution of B/P ratios weighted by employment shares, 1989 and 1990

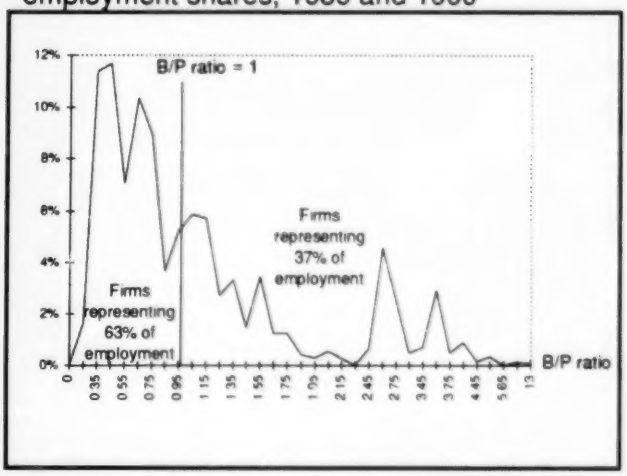
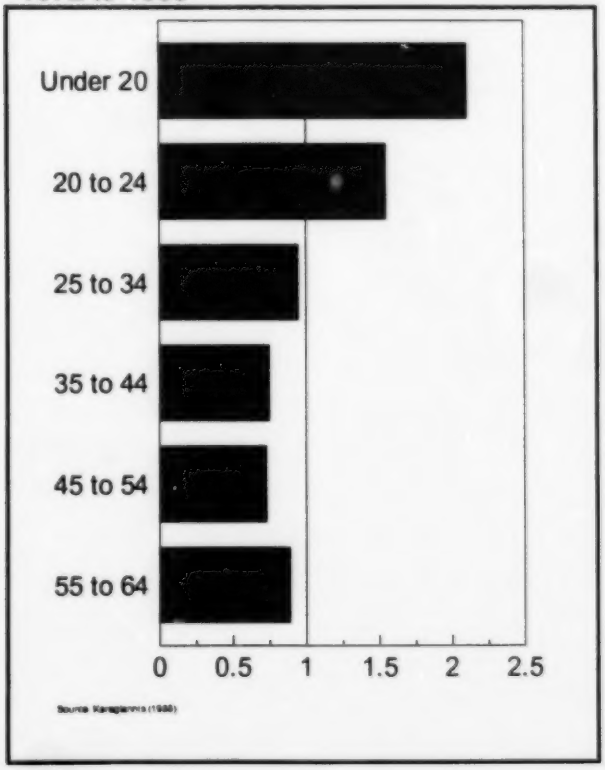


Figure 2 shows the average distribution of benefit/premium (B/P) ratios by industry employment share in 1989 and 1990. The B/P ratio is the quotient of total benefits paid to workers and premiums paid by workers and firms within an industry; it has been normalised so that the employment-weighted industry average B/P equals unity. Evident from this figure is that a minority of industries benefit disproportionately from UI at the expense of the majority: industries representing 63 per cent of employment have a B/P less than one -- indicating they pay more into the system than they receive; industries representing 37 per cent of employment have a B/P ratio greater than one -- indicating they receive more than they pay. An obvious implication of this is that implementing an experience-rated UI system would reduce premium payments for a majority of firms: ignoring consideration of behavioural responses, premium payments would fall for firms accounting for 63 per cent of employment.

There is also substantial within-industry variation in net benefits, in addition to cross-industry variation. This suggests that inter-industry transfers reflect as much the management practices of individual firms as inherent patterns of unemployment

resulting from industry differences in business conditions. Corak (1994) examines this issue by considering the distribution of 'always-subsidised' and 'never-subsidised' firms across industries. Always-subsidised firms are those whose benefit liabilities exceed premiums in every year of the analysis -- from 1986 to 1989. Always-subsidised firms are responsible for a disproportionate amount of benefit liabilities: they account for 12.1 per cent of all firms, 14.1 per cent of employment, but 38.1 per cent of UI benefit payments. Never-subsidised firms are those whose premiums exceeded their benefits in every year from 1986 to 1989. An indicator of the substantial within-industry cross-subsidisation created by UI is that many industries contain a high proportion of both types of firms; always-subsidised firms, for example, comprise about 15 per cent of firms in the Trade-Contracting industry -- which is not surprising given that it is a net beneficiary from UI; however, never-subsidised firms comprise an equivalent portion of the industry. Similarly, there are more never-subsidised firms in the Building Construction industry than always-subsidised firms, despite the industry being a net UI beneficiary.

Figure 3:
UI benefits per dollar of contribution by age, 1972 to 1985



Other transfers created by UI suggest potential gains from experience-rating beyond those associated with the inter-industry allocation of labour and production. For example, subsidies created by UI may affect the labour force participation decisions of youths. As can be seen from Figure 3, those under 24 benefit disproportionately from net UI transfers. This subsidy arises because of the high incidence of unemployment among this group. By subsidising this pattern of unemployment, UI could be encouraging youth to enter the labour market prematurely -- to the detriment of their long-term employment prospects. May (1993) provides some evidence of this effect among rural

Newfoundland youths. Experience-rating UI would remove the subsidy given to firms and industries with unstable employment patterns, and thus eliminate these subsidies to youths.

3. Effects of experience-rating: a review of the empirical literature

The large majority of empirical evidence on the effects of experience-rating is based on the U.S. data, as it is the only country that has operated an experience-rated system for an extended period. The estimated degree of experience-rating is not an explicit parameter of a state's UI premium structure, rather it reflects the combined effects of its many different elements. Many early studies determined the effect of experience-rating by estimating the impact of the individual parameters of a state's UI premium structure on unemployment. The results from this work consistently find that changes to parameters which increase the degree of experience-rating reduce unemployment and turnover. These studies include Feldstein (1977), Brechling (1981), Halpin (1979, 1980), Kaiser (1987) and Saffer (1982 and 1983). The relationship, however, between these parameters and the degree of experience-rating is defined only qualitatively, so that it is not possible to explicitly determine the impact of experience-rating on unemployment.

Only five studies provide quantitative estimates of the effect of a change in the degree of experience-rating. These include Topel (1983, 1984b and 1985), Card and Levine (1993) and Anderson and Meyer (1994); their results are summarised in Table 1. The manner in which the results are expressed differs across studies[5]. In order to facilitate comparison we present these results using a standardised definition which depicts the per cent reduction in unemployment resulting from a 1 percentage point increase in the marginal tax cost (MTC) of UI benefits. The MTC is the proportion

Table 1:
Estimated effects of experience-rating on unemployment

Study	Impact of a one per cent change in MTCs	
	U-temp	U-total
Topel (1983)	0.4	------
Topel (1984)	0.29	0.21
Topel (1985)	0.49 to 0.64	0.30 to 0.34
Anderson & Meyer (1994)	0.32 to 0.53	0.19
Card & Levine (1994)	1.15	0.22
Average	0.57	0.24

[5] Topel, for example, defines his experience-rating variable as the value of weekly benefit payments that are not recovered through an experience-rated tax. Other studies consider the effect of changes in MTCs. In most cases elasticities are expressed relative to the unemployment rate and average level of experience-rating within the data-set used. The estimates in the text are expressed as $\partial U/\partial (MTC)^*U$, where U is the unemployment rate.

of benefit received by a worker that is charged back to the firm which laid him off. The advantage of this format over that originally used by the authors is that it is independent of both average benefit levels and the average degree of experience-rating within the data set employed in the estimation.

The primary effect of experience-rating is through its impact on temporary layoffs: estimates show that a 1 per cent increase in MTC reduces temporary unemployment between 0.29 per cent and 1.15 per cent -- having a mean effect of 0.57 per cent. When this is combined with the smaller effect of experience-rating on permanent separations, estimates indicate that a 1 per cent increase in MTC reduces total unemployment between 0.19 per cent and 0.34 per cent --having a mean effect of 0.24 per cent. These results imply, for example, that moving from a non-experience-rated to a fully-experience-rated system (increasing MTC from 0 to 1) would reduce total unemployment by 24 per cent, and temporary layoff unemployment by 57 per cent[6].

Several qualifications should be placed on these findings. First, these studies employ a partial-equilibrium framework. They are based on estimating the relationship between an individual's probability of unemployment and the level of experience-rating within his firm or industry of employment and do not consider the effect of experience-rating on the distribution of employment across industries, aggregate employment or labour force participation. Consequently, they cannot capture general-equilibrium effects. For example, an increase in experience-rating shifts the incidence of UI premiums from stable to volatile industries, which could be expected to cause a corresponding shift in industry employment shares. This also lowers unemployment by reducing the relative importance of volatile high-unemployment industries. Deere (1991) estimates that increasing the degree of experience-rating in the U.S. from its current average level of about 60 per cent to 100 per cent would reduce temporary unemployment about 5 per cent solely through its effect on the inter-industry allocation of labour. Second, these findings are based on examining the effect of incremental changes in MTCs across firms, industries and states; extrapolating these to consider large changes in MTCs involves assuming the relation between MTCs and unemployment is globally linear.

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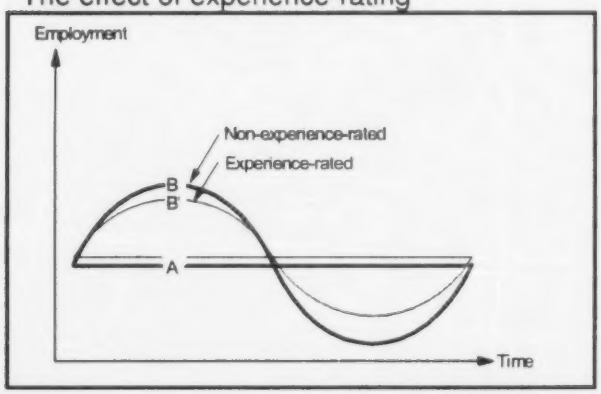
6 U.S. studies normally report the effect of increasing MTCs from the existing level of about .6 to 1, which is why results reported in the literature are lower than those reported here.

Third, the methodological soundness of these studies is primarily contingent on their ability to isolate the effect of exogenous changes in MTCs on unemployment. There are several sources of simultaneity between MTCs and unemployment, which, if they are not eliminated, can upwardly bias the magnitude of estimated coefficients. Success in isolating exogenous changes in MTCs varies across studies; arguably, the most successful is Anderson & Meyer (1994)[7]. Their results are comparable with other studies, which suggest that previous work is not unduly affected by possible residual sources of simultaneity bias which were not accommodated. Specifically, the estimated elasticity of MTCs on temporary unemployment ranges from 0.32 to 0.53 in Anderson and Meyer, and the effect on total unemployment ranges from 0.17 to 0.19; both of which are close to the mean of estimated elasticities.

In summary, although econometric estimates find that experience-rating is effective in reducing unemployment, they consider the incentives within a partial equilibrium framework that is unable to capture the aggregate effects of experience-rating on the inter-industry employment shares and aggregate employment and labour force participation. In addition, there has not yet been an estimate of the influence of experience-rating on aggregate output, either directly through its influence on labour market equilibrium or indirectly through its influence on the inter-industry allocation of goods and services. Thus there is no single analysis of allocative efficiency, labour reallocation and maximisation in a multi-sector model.

Figure 4:
The effect of experience-rating



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7 A major source of simultaneity bias arises because states impose maximum and minimum limits on premium rates. Firms constrained at the maximum or minimum rate have zero MTCs, as small changes in their incidence of layoffs will not affect their premium liability. For example, an increase in unemployment within a firm whose premium rate is constrained at the maximum cannot increase its premium liability, as its rate cannot rise any further. Firms are constrained at the maximum rate because of their high incidence of unemployment, so there is a negative correlation between MTCs and unemployment that is independent of the effects of experience-rating. Obversely, firms with low incidence of unemployment can be constrained at the minimum, creating a positive correlation; however, this is likely to be dominated by the former effect. All studies attempt to correct for the bias this creates, arguably, Anderson and Meyer (1994) do it in the most definitive manner. In one estimation the authors exclude all firms whose premiums are constrained at the minimum and maximum rate -- thus eliminating this source of simultaneity. The estimated effects of experience-rating are smaller than when constrained firms are included but not substantially different, suggesting that estimated coefficients are not unduly biased by this source of simultaneity. The authors also address other potential sources of simultaneity bias. In one estimate the authors difference their data to remove the influence of unobservable firm-specific and individual-specific fixed-factor effects; in another estimate they instrument MTCs on a number of different measures. In all cases experience-rating is found to significantly reduce the probability of unemployment.

4. MODELLING METHODOLOGY

Figure 4 can be used to illustrate the methodology needed to undertake an appropriate evaluation of the impacts of a non-experience-rated system on economic performance. Take an extremely simplified case of two firms: the labour demand of one, A, is stable, but that of the other, B, fluctuates cyclically. The number of workers firm B lays off over a cycle is given by the difference in its labour force between the peak and trough of the cycle. A non-experience-rated UI system is assumed as a starting point.

What would be the impact of introducing experience-rating in general? Firm B would want to reduce its layoffs in order to lower its UI tax liability. It would do this by hiring fewer workers at the peak of its cycle, maintaining a larger workforce in the trough and generally reducing the cyclically of its labour demand. Its employment pattern might shift to B'. In aggregate, this shift would also affect the equilibrium wage level, and thus influence employment and output in both sectors. This is suggestive that a proper model to capture the overall economic impacts of experience-rating must have at least three features: it must have the stochastic labour demand that generates unemployment; it must be multi-sectoral; and, it must be general equilibrium. The next sub-section deals with the first of these requirements while the following sub-section examines the remaining two requirements.

4.1 An optimal-contract framework

The effects of UI and experience-rating are modelled using an optimal-contract framework similar to that developed in Azariadis (1975), Baily (1974, 1977), Feldstein (1976) and Gordon (1974), as it embodies a key characteristics of labour market behaviour. Namely, that in many cases, job separations are the result of foreseeable fluctuations in labour demand, so workers can incorporate the probability of being unemployed in negotiating their compensation package. In this framework, workers demand higher wages in exchange for unstable job tenure. A firm's profit-maximising choice involves a trade-off between the costs of providing enhanced job security and higher wages. Job security provisions could either be explicit through a negotiated agreement, or implicit where workers draw inferences over the stability of a job based on their knowledge of the firm's past employment practices. Realising this, the firm

considers the potential effect of its labour practices on future wage costs in deciding how to deal with fluctuations in labour demand.

Using the optimal contract framework, a firm's hiring and layoff decisions can be described by a simple model in which its labour demand alternates discretely between a high- and low-demand state, with the proportion of the time spent in each state given by λ and $(1-\lambda)$ respectively. Firms must attract workers from a competitive labour market in which the prevailing wage for a job that offers stable employment is W. This implies that the utility workers could get from working in an unstable firm should be as big as that from working in a stable firm. It follows that the firm's problem is to maximise its profits subject to the constraint that the value of the worker's labour contract must equal the value of working in a stable job at wage, W. The firm's profit function can be expressed as follows:

$$1) \quad \underset{N,n,w}{Max}\ \lambda(R_h(N) - Nw) + (1-\lambda)(R_l(n) - nw)$$

where other factors of production are omitted in order to focus on the firm's human resource decisions. The firm's revenue function for the high- and low-demand period is given by $R_h(N)$ and $R_l(n)$; N is the number of workers the firm contracts to satisfy its labour demand in the high-demand state; n is the number it maintains during the low-demand state; and w is the worker's wage rate. The wage rate is assumed to be constant across periods; but this would also follow from the first-order conditions if it was allowed to vary. The revenue function is assumed to satisfy standard second-order conditions.

If workers are laid off during the low-demand state they are assumed to be unemployed for the entire period. The probability of unemployment, α is thus: $\alpha = (1-n/N)(1-\lambda)$. Workers are assumed to be risk neutral and their utility function strongly separable, so their expected utility can be expressed as in equation 2), where the value of leisure is given by L.

$$2) \quad W = \left[\lambda + \frac{n}{N}(1-\lambda)\right]w + \left(1 - \frac{n}{N}\right)(1-\lambda)L$$

Whether unemployment is terminated by a return to a previous or new employer is not addressed here, as it does not affect the conclusions of this analysis.[8] The restrictions on the specification of the utility function are assumed for analytical convenience. The results which would follow from a more general specification are substantially the same. The firm maximises its profits subject to the worker's utility constraint. The resulting first-order conditions can be manipulated to provide equations 3) and 4), which are, respectively, the equilibrium conditions for the number of workers hired in the high-demand period (N), and the number retained during the low-demand period (n). An apostrophe indicates the derivative of a function or variable.

3) $\lambda R_h'(N) = W - (1-\lambda)L$

4) $(1-\lambda)R_l'(n) = (1-\lambda)L$

Equation 3) states that workers will be hired until their marginal value product (MVP) during the high-demand period equals the market equilibrium value of a labour contract (W), net of the value of leisure derived by a worker if they were laid off. This is the compensation required by a worker facing certain layoff during the low-demand period. Equation 4) states that in the low-demand period workers will be laid off until their MVP equals their value of leisure. Once a worker is hired the firm's decision is then whether to employ him part- or full-year. It can only save (1-λ)L -- the value of a worker's leisure --by laying him off during the low-demand period, so this is a worker's shadow wage during the low-demand period.

One implication of the optimal contract framework is that firms responds to fluctuations in labour demand in a Pareto-optimal manner: a firm maintains a worker providing the value of his time is worth more to him (as leisure) than to the firm (as labour), despite his MVP being below his wage. This is because workers consider both the opportunity cost of unemployment as well as their wage when choosing where to work, which forces firms to internalise the cost of their layoff decisions. Anything that pushes equilibrium away from this point is thus allocatively inefficient.

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[8] Bailey (1978) describes the conditions under which a worker returns to a previous employer or seeks new employment within an optimal contract framework.

The effects of UI and experience-rating at the firm level

The effect of UI and experience-rating can be incorporated as follows: let b represent benefit payments, e the firm's marginal tax cost (MTC) in an experience-rated system -- the proportion of benefits for which the firm is liable, and δ be an employment tax levied to finance the non-experience-rated portion of benefits, which adjusts to ensure the UI system is self-financing[9]. The worker's value of leisure is now (L+b) as it includes the benefit payments received while unemployed. Benefits paid to laid-off workers are (N-n)(1-λ)b, so that the firm's premium liability resulting from its layoff decisions is (N-n)(1-λ)eb. Firms are assumed to be sufficiently small relative to the economy that their individual labour resource decisions do not affect the value of δ, so they consider this parameter exogenous in their maximisation decision. The firm now maximises the following profit function:

5) $$\pi = \lambda(R_h(N) - N(w+\delta)) + (1-\lambda)(R_l(n) - n(w+\delta) - eb(N-n))$$

subject to:

6) $$W = \left[\lambda + \frac{n}{N}(1-\lambda)\right]w + \left(1 - \frac{n}{N}\right)(1-\lambda)(b+L)$$

The profit maximising values for N and n are thus given respectively by:

7) $$\lambda R_h'(N) + (1-\lambda)eb = W + \delta - (1-\lambda)(b+L)$$

8) $$R_l'(n) + eb = \delta + (b+L)$$

To interpret these conditions, first consider the effect of UI in the absence of experience-rating (i.e., e=0). Being a payment contingent on unemployment, UI benefits raise the value of leisure. This increases the number of workers a firm hires to meet its peak demand, but decreases the number it maintains during low-demand periods. The number of workers under contract, N, rises because the increase in the

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9 Indexing firms in the economy over i, δ will be given by:

$$\delta = \frac{(1-e)b\sum_i w_i\alpha_i}{\sum_i w_i(1-\alpha_i)}$$

value of leisure reduces a firm's cost of maintaining a worker for only the high-demand portion of the period: workers are willing to accept a larger reduction in their total compensation in exchange for being unemployed (1-λ) of the time. Note that the firm appropriates the total value of benefits paid to the worker, so that UI effectively is a subsidy payment for contracting workers. In the low-demand period, benefits reduce employment by raising a worker's shadow wage in the low-demand period. The employment tax (δ) also raises the equilibrium MVP in the low-demand period: here, benefits act as a tax on employment. By increasing N and decreasing n, UI unambiguously increases the incidence of layoffs.

Next, consider the effect of experience-rating. Simply put, it attenuates the distortionary effect of UI. By setting e to 1, it is easy to show from equations 7) and 8) that the effects of UI on employment equilibrium are completely eliminated. This is because experience-rating forces firms and workers to internalise the costs of UI benefits their decision making.

4.2 Specifying the multi-sector general equilibrium model

The general equilibrium model is composed of three-regions, Canada, the United States and the rest of world (ROW); however, only Canada is completely endogenous, with factor prices, demands and supplies adjusting to maintain equilibrium in all markets. The U. S. and ROW are represented by a set of export demand equations in which foreign income and prices are exogenous. Within the Canadian region, there are 63 manufacturing industries, 13 primary industries and 19 services industries including public administration, for a total of 95 industries. Each industry produces a single composite commodity using a two-state technology function, reflecting the high- and low-demand states.[10] Non-competitive imports are aggregated into a ninety-sixth commodity. Government expenditures on goods and services, although treated as final demand in the input-output accounts, are treated as a productive activity in the model. This treatment is adopted due to the significant contribution made by government to value added. Government taxes, net of subsidies, are given back to the consumer as lump-sum transfers.

Factors of production include labour, capital, and intermediate materials. The aggregate labour supply is fixed, and the extent to which it is fully-employed is

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[10] The only exception is the owner dwelling industry that do not use labour as factor of production

determined endogeneously. Capital is assumed to be perfectly mobile internationally; and net capital flows adjust to ensure markets clear in Canada. Its price is also assumed to be fixed. Firms substitute across both factors and intermediate inputs in response to changes in their relative prices. Labour and capital are mobile across industries.

Output

Industrial production in Canada has been divided into 95 separate industries, each employing two different production technologies, one for each state of the economy. Total production for each industry is equal to the sum of the production for each state. Omitting the industry subscript, the production function is given by:

$$9) \quad Y = \lambda F_h(k, N, \text{int}_h) + (1-\lambda) F_l(k, n, \text{int}_l, ff_l)$$

where F(•) represents the production function for each state of labour demand, and λ is the proportion of time spent in the high-demand state. N and n are the amounts of labour used in the high and low state respectively. Capital use is given by k, and is the same in each state. A fixed factor, ff_l, is introduced into the low demand state to provide for diminishing returns to scale.

Production in the high demand state is described by nested Constant Elasticity of Substitution (CES) functions. At the top level, the elasticity of substitution between capital, labour and intermediate goods is 0.5. This is in accordance with estimates of CES elasticities reported in Hamermesh (1993). The second level accommodates substitution between domestic and imported goods, and is described later.

A similar production function is used in the low-demand state, except a third CES nest is introduced to provide for substitution between labour and a fixed factor. The fixed factor is introduced in recognition that many industries face constraints which impose a limit on the extent to which their output can expand during their off periods, irrespective of how low the opportunity cost of labour drops. Agriculture, fishing and forestry, for example, can expand their seasons at the margin, but are ultimately limited by the onset of winter; retail sales are governed by seasonal shopping patterns, and financial constraints may prevent manufacturers from completely stabilising production through inventory adjustment. As discussed in more detail in the following section, the aggregate effect of experience-rating on output and unemployment is sensitive to the

value of the elasticity of substitution between labour and the fixed-factor (E^{ff}), but the distribution of the effect across industries is not.

Using the dual form, the firm's problem is to minimise its cost given its production function and the worker's utility constraint. The utility constraint assumes that workers have a constant marginal utility of income and leisure[11]. The dual problem is given by:

10) $$\underset{k,\text{int}_{jh},\text{int}_{jl},N,n,w,ff}{Min} \; rk + w\left[\lambda N + (1-\lambda)n\right] + \sum_j p_j\left[\lambda_t \,\text{int}_{jh} + (1-\lambda_t)\text{int}_{jl}\right]$$

subject to

11) $$Y = \lambda F_h(k, N, \text{int}_h) + (1-\lambda)F_l(k, n, \text{int}_l, ff_l)$$

12) $$W = \left[\lambda + \frac{n}{N}(1-\lambda)\right]w + \left(1 - \frac{n}{N}\right)(1-\lambda)(b+L)$$

13) $$N \geq n$$

14) $$ff \leq FF$$

The first-order conditions to this problem are given by:

15) $$r - \theta\left(\lambda f_{hk} + (1-\lambda)f_{lk}\right) = 0$$

16) $$p_j - \theta\lambda f_{h\text{int}_j} = 0 \qquad j = 1,96$$

17) $$p_j - \theta(1-\lambda)f_{l\text{int}_j} = 0 \qquad j = 1,96$$

18) $$\lambda\left(w - \theta f_{hN}\right) - \mu\left[(1-\lambda)\left(-\frac{n}{N^2}w + \frac{n}{N^2}(b+l)\right)\right] = 0$$

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[11] This assumption allows the relation between a worker's probability of unemployment and wage to be described using a linear function which considerably simplifies the model.

19) $(1-\lambda)(w-\theta f_{ln})-\mu\left[(1-\lambda)\left(-\frac{w}{N}-\frac{(b+l)}{N}\right)\right]=0$

20) $\lambda N+(1-\lambda)n-\mu\left[\lambda+(1-\lambda)\frac{n}{N}\right]=0$

21) $\kappa-\theta(1-\lambda)f_{lff}=0$

Where θ, μ and κ are the Lagrangian multipliers associated with the production constraint, the wage constraint and the fixed factor constraint.

The interpretation of the first three conditions is straightforward; θ represents the unit cost of output, and within a competitive equilibrium is also the output price. Consequently, equation 15) implies that the average MVP of capital should equal its user cost. Equations 16) and 17) imply that the MVP of intermediate goods should equal their price.

Equations 18) and 19) provide the equilibrium conditions for N and n. By substituting for μ from equation 20), they can be manipulated to obtain equations 22) and 23), which are equivalent to equations 7) and 8) in section 4.1. These give the shadow price of labour in each state.

22) $\lambda\theta f_{hN}=W-(1-\lambda)(b+l)$

23) $\theta f_{ln}=b+l$

Equation 20) can be transformed to show that the average MVP of labour equals the industry wage (w), which is the equilibrium condition for labour that would arise in a standard, non-stochastic framework.

Final demand

Separate agents are used to represent final demands for consumption and investment, as the commodity composition of demand differs across the two categories. The consumer and the investor solve a static, one-period maximisation problem to determine final demand levels. The consumer's utility is represented by a nested CES-Cobb-Douglas function. At the top level, income is allocated between consumption and

saving using a CES function. At the second level, a Cobb-Douglas function is used to determine consumption of each good. The utility function for the consumer is:

$$24)\ U = \left[\left(\prod_j C_j^{\beta_{Cj}} \right)^{\frac{(\rho-1)}{\rho}} + S^{\frac{(\rho-1)}{\rho}} \right]^{\frac{\rho}{(\rho-1)}} \qquad j = 1,96$$

where C_j is consumption of commodity aggregate j, β_{Cj} is the Cobb-Douglas parameter for commodity aggregate j, S is saving and ρ is the elasticity of substitution between consumption and saving, which is 0.5.

For the investor, the functional form used is the same as for the consumer except that there is no saving. Thus, the utility function is given by:

$$25)\ INV = \prod_j I_j^{\beta_{Ij}} \qquad j = 1,96$$

where I_j is investor's use of commodity aggregate j, β_{Ij} is the Cobb-Douglas parameter for commodity aggregate j.

Consumer and investor demands are determined by market prices and aggregate income. The consumer receives all income paid to domestic capital and labour net of taxes and depreciation expenses, plus the excess of government tax revenues over subsidies, which accrues as a lump-sum transfer. Although any pattern of property rights can be specified, it is generally assumed that the returns to labour accrue wholly to the consumer in the country in which he is employed. The investor receives savings from the consumer and depreciation expenses on domestic capital, which is spent entirely on investment goods.

Trade

International trade is based on the Armington (1969) assumption that agents differentiate among products on the basis of their countries of origin. This assumption is invoked to explain the existence of infra-industry trade. It is a useful approximation to more rigorously developed models of infra-industry trade such as Krugman (1980),

which are based on scale economies and within-industry variations in product characteristics. For each commodity, imported goods are combined with domestic production to form a composite good that is used in domestic production and final demand. Within the composite good, substitution between domestic and imported goods is determined using a CES function. From this, import demand functions can be derived. The same functional form is used to specify U.S. and ROW preferences across foreign and domestic goods; however, each region's income is exogenous, so their demand for Canadian exports is solely a function of relative prices.

Equilibrium

The model iterates until prices and quantities are in equilibrium in all markets. For the labour market, this means that the sum of demands in the high labour demand state equals the fixed labour endowment:

$$26) \quad \sum_j N_j = \overline{N}$$

where $\overline{N}$ is the fixed endowment of labour.

The model is closed by assuming that capital demand adjusts to ensure that the value of service payments (receipts) for imported (exported) capital equals the balance of trade in commodities. This yields an overall balance of payments equilibrium.

4.3 Data and calibration

Industry output and intermediate input demand are calibrated using the 1990 input-output tables, which is supplemented by the 1985 census data from Statistics Canada to calibrate the 8 agricultural industries in the model. Data from both sources are transformed to be conformable with the 95 sector structure of the GE model. Canadian import price elasticities are obtained from Létourneau and Lester (1988). Canadian export price elasticities are derived from estimates of U. S. import price elasticities in Almon et al. (1975). The elasticity of substitution between current consumption and saving is set to 0.5. A Cobb-Douglas specification is employed for domestic production and demand functions, so they can be calibrated using expenditure shares from the input-output tables.

Labour market characteristics are calibrated using unpublished data for 1989 and 1990 developed by Miles Corak and Wendy Pyper[12] in their analysis of the distribution of UI benefits and premiums across and between industries. This data set provides a 275-industry breakdown of average weekly benefits, the number and average duration of claims and a similar breakdown of wages and employment. The average duration of benefit receipt is used to determine the portion of time in the low-demand state ($1-\lambda$); an effective benefit replacement rate for each industry, b, is calculated as the quotient of industry average weekly benefits and wages. Industry wages are taken from Statistics Canada (1999 and 1990), supplemented with unpublished data.

Corak and Pyper's data distinguish between UI claims arising from temporary or permanent separations. The incidence of temporary separations is multiplied by the average duration of benefit receipt, ($1-\lambda$), to yield an estimate of temporary unemployment, which can then be used in conjunction with data on industry employment levels to calculate UI insured temporary unemployment rates. Under this definition, temporary separations account for 47% of UI insured unemployment in Canada.

The decision to restrict estimates to consider the effect of experience-rating on temporary unemployment rather than total unemployment is based on a number of considerations. First, in the optimal contract model wages are endogenous to foreseeable unemployment, as a worker's wage demand can only be affected by unemployment that can be anticipated. Unemployment arising from seasonal or cyclical fluctuations in labour demand are likely to be far more predictable than that due to idiosyncratic shocks such as business closures or job mismatches, so it is appropriate to focus on these. Considering only those who are temporarily unemployed provides an approximate representation of this group. If anything, it understates the proportion of unemployment generated by seasonal or cyclical effects, as some of the resulting separations will be permanent.

Second, for permanent separations, such as those arising from plant closures or job mismatches, the effect on firm's layoff decision of UI benefits or the liability generated by an experience-rated premium may be small compared to other factors, as their value is small relative to other costs. This point was originally made in Topel

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[12] Statistics Canada (1995)

(1985). Specifically, in deciding to lay a worker off in response to a transitory fluctuation in labour demand, the firm considers only the potential costs and benefits associated with employing him only over the expected period of the layoff. Under an experience-rated system, the increase in UI premium liability resulting from the layoff could be relatively large compared to these costs, and likely would have a large impact on the decision. The decision to permanently lay off a worker is based on considering the potential costs and benefits associated with employing him over the indefinite future. In this case, the increase in UI premiums resulting from a layoff under an experience-rated system would be relatively small compared to these sums and would likely have a correspondingly smaller influence on the decision. Again, temporary unemployment provides a reasonable approximation of those whose layoff is expected to be temporary. In this context, a better measure would be based on ex-ante expectations of whether a layoff was temporary or permanent, but data limitations preclude this.

Third, the definition of temporary unemployment is similar to that used in U.S. econometric estimates of the effect of experience-rating. Both Corak and Pyper consider a separation to be temporary if a job match is re-established at some later date in their data. Anderson and Meyer (1994), for example, use a similar definition[13].

Knowing industry values for b, λ and the temporary unemployment rate, and assuming that the outside wage and marginal utility equal one, model consistent values for industry wage rates can be calculated using equation 12). This allows us to calibrate the total quantity of labour used in each state.

To complete the cost function calibration, assumptions need to be made on the allocation of intermediate inputs and the MVP of capital across low- and high-demand states; intermediate inputs are allocated between states in the same proportion as labour, and in each state, the MVP of capital is assumed to be equal to its user cost.

The fixed-factor was introduced by apportioning to it 10% of the value of labour in the low-demand period. This introduces diminishing returns-to-scale in the low-demand state, but does not alter the incentive effects of experience-rating on the allocation of labour across industries in the high-demand state. The choice of how

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[13] The authors use data from the Continuous Wage And Benefit History project, which is used to identify employer/employee job matches by quarter over the period 1978 to 1984. A temporary separation occurs if there is a temporary break in an employer/employee job match. A permanent separation occurs if there is no job-match in the final quarter of the data set.

much labour to apportion to the fixed-factor is somewhat arbitrary, but not crucial to the analysis. The elasticity of labour demand in the low-demand period is jointly determined by the share of labour allocated to the fixed-factor and the elasticity of substitution between fixed and variable labour (E^{ff}). Any effect of changing the share of labour apportioned to the fixed-factor on the elasticity of demand for labour in the low-demand state can be equivalently achieved through changes in E^{ff}. Sensitivity analysis is performed on the latter variable, and the results also indicate the effect of changing the amount of labour apportioned to the fixed-factor.

5. SIMULATION RESULTS

Five simulations were undertaken to estimate the effect of fully experience-rating UI. Full experience-rating is equivalent to setting benefits, b, equal to zero in equations 22) and 23). The simulations differed in the value assigned to the elasticity of substitution between labour and the fixed factor, E^{ff}, in the low-demand period, which is varied between 0 and 0.05. When the elasticity is set equal to zero, employment within each industry in the low-demand period is fixed. All adjustment occurs through the re-allocation of labour in the high demand period. In this case the entire effect of UI is through its effect on compensating wage differentials and relative labour costs across industries. Diminishing returns to scale in the low-demand period are absolute, and changes in unemployment occur solely through shifts in the industrial distribution of labour. The opposite case, where there are no constraints on production in the low demand period, is given by setting the elasticity of substitution equal to infinity. When this value is set appreciably above 0.05, however, the model solves to a corner solution where unemployment is entirely eliminated.

For the base case scenario, an elasticity of substitution of 0.0375 was chosen. In this case, full experience-rating reduces unemployment 2.17 percentage points: a drop which represents 45.5% of temporary unemployment and 23% of total unemployment. This result corresponds to U.S. estimates of the effect of fully experience-rating UI. Table 2 summarises the aggregate impacts of experience-rating for the base case and other scenarios; table 3 presents sectoral results for the base case simulation; and sectoral results for other simulations are provided in the Annex.

5.1 Discussion of results

Aggregate Results

Looking at the aggregate results in Table 2, we find that Canadian GDP rises by 2.2 per cent, and aggregate unemployment falls by 2.2 percentage points, as a result of experience-rating. Increased employment causes the marginal product of capital to rise, leading to increased imported capital. In addition, the fall in production costs resulting from the elimination of distorting transfers and subsidies lowers the price of Canadian exports, causing the terms of trade to worsen somewhat. Because of both of these effects, real GNP rises a little less at 1.9 per cent. The increase in employment during the low-demand period reduces the marginal value product of labour so that aggregate wages fall.

Table 2: Aggregate impacts of full experience-rating

	Base Case Scenario	Alternate scenarios			
Elasticity of substitution (E^{ff})[a]	0.0375	0	0.0125	0.025	0.05
		(Per cent except where noted)			
Real GDP	2.2	0.4	1.1	1.7	2.8
Real Labour Income[b]	1.9	0.1	0.8	1.3	2.4
Real Income[b]	1.9	0.3	0.9	1.4	2.4
Aggregate wage	-3.9	0.7	-2.0	-3.3	-4.5
Capital Imports[b]	0.3	0.1	0.2	0.3	0.4
Terms of trade	1.0	0.4	0.6	0.8	1.1
Unemployment (percentage point)	-2.2	-0.2	-0.9	-1.5	-2.8

Notes: a) Elasticity of substitution between the fixed factor and labour in the low-demand period
b) as a per cent of GDP

In addition to reducing the propensity of all firms to lay off workers, experience-rating UI also causes a re-allocation of labour from volatile to stable industries. This latter effect is isolated in the simulation where E^{ff} equals zero. In this case, changes in output and employment occur entirely through the re-allocation of labour across industries, as firms are unable to respond to experience-rating by increasing employment in the low-demand period. Real income increases by 0.3 per cent and GDP by 0.4 per cent. The shift in labour from volatile to stable industries causes the unemployment rate to fall by 0.2 percentage points.

Sectoral results

Examining sectoral results in Table 3, real value-added rises in 82 of the 95 industries. Fish processing and fish harvesting are the two industries that undergo the most dramatic decline, with real value-added falling 12.2 and 10.8 per cent respectively[14]. Obversely, motor vehicles and motor vehicle parts are both among the 5 industries experiencing the largest increase in real value-added, rising 9.3 and 11 per cent respectively. Unemployment falls in 72 of 95 industries. Unemployment increases in industries experiencing the strongest growth, as the advantage experience-rating provides them in attracting labour during the high-demand period outweighs their ability to increase employment in the low-demand period. However, the unemployment rate declines in all sectors. The patterns of inter-industry wage changes are less well defined; however, there is a tendency for wages to rise in industries experiencing the largest decrease in unemployment[15]. The contraction of employment in these industries is generally greater than the fall in capital, so the MVP of labour increases.

Sensitivity analysis

As can be seen from the Annex, raising E^{ff} does not significantly change the sectoral impact of experience-rating UI on output or employment in the high-demand period, implying that the allocative effects of experience-rating are insensitive to this parameter. The primary impact of increasing E^{ff} is to raise employment and output in the low-demand period. This mitigates the impact of experience-rating on the minority of industries adversely affected, and strengthens gains in the remaining industries. In a separate simulation that is not presented, where E^{ff} equals 0.5, increases in employment and output in the low-demand period are sufficiently strong that employment and total real output increase in all industries except two. A rise in E^{ff} also reduces wages: the expansion of employment in the low-demand period reduces the MVP, so there is a corresponding reduction in wages.

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14 The results for retail trade, food & accommodation and personal services are problematic. UI recipients in these industries tend to have higher than average weekly earnings, as benefits are generally unavailable to part-time workers. This causes an overstatement of the benefit/wage ratio, and of the incentive effect of experience-rating.

15 The decline in wages within the fishing, retail trade and food & accommodation industries is an artefact of the model resulting from the unemployment rate solving to a corner solution for these industries. The model contains an adjustment mechanism to equalise the cost of labour in the high- and low- demand periods in industries where unemployment falls to zero. The effects of this adjustment mechanism, however, are not captured in the output on industry wages.

Table 3: Effects of experience-rating by sector
(per cent change shock minus control)

	Real Value-added	Total output	High demand output	Low-demand output	Total employment	Low-demand labour force	High demand labour force	Unemployment rate (percentage point change)	Industry wage
Fish Processing	-12.2	-11.3	-20.8	1.8	-13.4	9.1	-27.4	-14.4	9.8
Fishing	-10.8	-10.1	-17.4	-2.6	-12.5	1.7	-24.2	-13.4	-12.7
Retail Trade	-4.7	-3.4	-7.9	2.1	-5.7	1.4	-11.1	-5.6	-11.6
Food & Accomm.	-4.4	-2.7	-7.3	2.5	-5.7	1.4	-11.2	-5.9	-11.2
Personal Services	-4.0	-2.3	-7.9	4.1	-4.6	3.9	-11.3	-7.0	8.7
Other Agri. Products	-2.8	-1.7	-5.9	3.2	-4.0	6.1	-11.8	-8.1	7.7
Forestry	-1.1	-0.3	-4.5	5.4	-0.5	8.9	-7.1	-6.3	4.1
Sawmills	-0.1	-0.7	-3.5	4.5	0.8	8.7	-3.2	-3.9	-1.3
Engraving	-0.4	0.1	-3.9	5.7	0.4	8.8	-5.2	-5.6	2.3
Hogs & Livestock Co.	-0.6	-0.4	-2.1	1.6	-1.1	9.0	-8.9	-7.9	5.7
Fruits & Vegetables	-0.6	-0.1	-2.7	2.9	-1.2	9.2	-9.2	-8.1	6.9
Small Grains	-0.3	-0.1	-2.2	2.4	-1.0	9.1	-8.8	-7.9	6.6
Other Transport	0.1	0.5	-2.6	4.3	1.0	8.4	-4.7	-5.5	1.8
Amusement & Rec.	-0.6	-0.5	-2.9	2.8	-0.6	8.9	-6.8	-6.2	4.4
Wheat	0.0	0.2	-1.0	1.6	-0.6	8.9	-8.0	-7.4	6.0
Poultry	0.1	0.3	-0.9	1.7	-0.5	9.0	-7.9	-7.3	6.1
Wool Yarn & Cloth	1.2	1.3	-0.9	4.8	1.9	8.9	-2.1	-3.9	1.2
Other Yarn & Cloth	1.5	1.7	-0.1	4.4	2.3	8.9	-1.5	-3.6	1.0
Clothing	0.9	1.2	-1.3	5.1	1.7	9.0	-2.5	-4.1	1.4
Dairy	0.6	0.8	-0.7	2.4	-0.3	9.1	-7.5	-7.2	7.0
Knitting Mills	1.1	1.4	-0.8	4.9	1.9	8.9	-2.2	-3.9	1.4
Non-Res Const.	1.2	1.8	-0.9	6.0	1.9	9.0	-2.3	-4.0	2.4
Repair Const.	0.6	1.3	-2.0	6.4	1.5	9.1	-3.1	-4.3	2.7
Cattle	0.9	1.1	0.2	2.1	0.1	9.0	-6.9	-6.8	6.7
Other Wood	2.2	2.0	0.3	5.1	3.1	8.8	0.3	-2.7	-0.8
Business Services	1.1	1.2	-1.7	5.7	2.0	8.8	-2.4	-4.3	1.3
Res. Const.	0.8	1.5	-1.4	6.0	1.5	9.0	-2.9	-4.2	2.4
Other Furniture	2.0	2.1	0.3	5.6	2.8	9.2	-0.3	-3.0	0.4
Meat Processing	1.5	1.0	-0.6	3.6	2.6	8.6	-0.7	-3.1	-0.8
Bakery & Biscuit	1.8	1.9	0.3	4.3	2.8	8.6	-0.7	-3.4	0.5
Shipbuilding	1.7	2.1	-0.4	6.0	2.7	8.8	-0.9	-3.3	0.3
Veneer Plywood & Other	2.5	2.3	0.9	4.8	3.5	8.7	0.8	-2.5	-0.7
Poultry Processing	1.9	1.6	0.1	4.2	2.9	8.7	-0.2	-3.0	-0.5
Boiler & Struct. Metal	2.8	3.0	1.6	5.4	3.7	8.8	0.8	-2.6	0.2
F.I.R.E.	2.6	2.4	1.3	4.0	3.9	8.1	1.0	-2.7	-0.5
Dairy Processing	2.4	1.8	1.3	2.7	4.2	8.0	2.1	-1.8	-2.2
Feed Industry	2.8	1.8	1.5	2.3	4.8	7.6	3.4	-1.4	-4.3
Communications	2.8	2.6	1.8	3.9	4.3	7.9	1.7	-2.4	-1.2
Household Chem.	4.0	3.9	3.4	4.7	5.3	8.1	3.3	-1.8	-0.7
Wholesale Trade	2.8	2.7	1.2	4.9	3.9	8.2	0.9	-2.8	-0.6
Architect. Metal	2.9	2.9	1.6	5.1	3.9	8.7	1.3	-2.4	-0.6
Other Textiles	3.1	2.8	1.6	4.8	4.1	8.6	1.8	-2.1	-1.1
Owner Dwelling	1.7	1.7	1.7	1.7	0.0	0.0	0.0	0.0	0.0
Sport And Toy Industry	3.4	3.1	2.2	4.5	4.6	8.2	2.3	-2.1	-1.2
Truck Transport.	3.2	2.8	2.1	4.1	4.5	8.2	2.4	-1.9	-1.8
Pharmaceutical	4.4	4.2	4.1	4.4	6.0	8.0	4.7	-1.2	-1.5

Table 3 (Con't): Effects of experience-rating by sector
(per cent change shock minus control)

	Real Value-added	Total output	High demand output	Low-demand output	Total employment	Low-demand labour force	High demand labour force	Unemployment rate (percentage point change)	Industry wage
Fruit Vegetables	3.6	3.1	2.9	3.6	5.4	8.1	3.9	-1.3	-2.6
Oth Trans. & Stor.	3.2	2.9	2.1	4.3	4.5	8.2	2.5	-1.9	-1.8
Misc. Manu.	3.7	3.5	2.6	5.0	4.8	8.3	2.7	-1.9	-1.2
Print & Publish	4.0	3.8	3.2	4.7	5.2	8.0	3.4	-1.7	-1.3
Air Transport.	3.2	2.6	1.4	4.6	4.2	8.3	2.0	-2.1	-1.9
Rail Transport.	3.3	2.8	1.7	4.7	4.3	8.3	2.2	-2.0	-1.9
Office Furniture	4.1	3.8	3.3	4.8	5.3	8.7	3.8	-1.4	-1.9
Misc. Food	3.6	2.9	2.8	3.1	5.7	7.7	4.6	-1.0	-3.7
Other Mining	4.3	3.9	3.6	4.5	5.6	8.3	4.3	-1.2	-1.9
Other Non Metal Minerals	4.7	4.5	4.2	5.1	5.9	8.6	4.5	-1.2	-1.3
Public Utilities	3.6	3.5	3.5	3.5	6.2	7.7	5.3	-0.8	-3.3
Agricultural M & E	4.3	4.0	3.6	4.8	5.5	8.7	4.1	-1.3	-1.8
Cement & Concrete	4.5	4.0	3.8	4.3	6.0	8.1	4.9	-1.0	-2.7
Mix Fert.& Other Chem.	4.6	4.2	4.2	4.2	6.3	7.7	5.5	-0.8	-2.5
Metal Stamping	4.4	4.4	3.8	5.4	5.5	8.6	3.8	-1.6	-0.7
Footwear Industry	3.9	3.4	2.7	4.9	4.9	8.6	3.1	-1.6	-1.8
Dist. & Brew.	4.1	3.7	3.7	3.7	6.2	7.8	5.4	-0.8	-3.4
Glass	4.9	4.6	4.3	5.4	5.9	8.6	4.6	-1.2	-1.3
Industrial M & E	4.9	4.7	4.3	5.3	6.0	8.5	4.7	-1.2	-1.5
Tobacco	3.7	3.2	3.5	2.8	6.8	7.0	6.7	-0.1	-5.4
Oil & Gas Wells	4.4	4.0	4.3	3.4	7.9	7.0	8.4	0.4	-6.1
Off. & Store M&E	4.4	3.7	3.5	4.1	5.9	8.1	4.7	-1.1	-2.7
Wire	4.7	4.5	4.0	5.4	5.7	8.5	4.2	-1.4	-1.4
Plastic	5.7	5.5	5.6	5.3	7.3	8.1	6.8	-0.4	-1.6
Leather Industry	6.5	6.1	6.2	5.8	7.4	8.8	6.8	-0.6	-1.5
Other Metal	5.2	5.2	4.7	5.9	6.1	8.7	4.7	-1.2	-0.7
Wire And Cable	5.4	5.1	5.1	4.9	6.9	8.2	6.3	-0.6	-2.2
Large Elect.App.	5.3	4.6	4.6	4.6	6.6	8.2	5.8	-0.8	-2.5
Refineries & Coal Prod	5.1	3.4	4.0	2.6	6.9	6.7	7.1	0.2	-4.9
Wineries	5.8	5.2	5.5	4.7	7.5	7.9	7.3	-0.2	-3.1
Electronic Eq.	5.9	5.4	5.5	5.1	7.2	8.2	6.7	-0.5	-2.3
Industrial Chem.	6.5	6.1	6.6	5.3	8.4	7.7	8.9	0.4	-2.9
Metal Mining	6.7	6.6	7.0	6.1	8.3	8.2	8.3	0.0	-1.3
Public Administr.	4.4	3.9	3.4	4.7	5.4	7.7	4.0	-1.3	-3.1
Small Elect.App.	6.0	5.6	5.8	5.2	7.3	8.2	6.8	-0.4	-2.3
Aircraft & Parts	5.7	5.3	5.3	5.1	6.9	8.2	6.1	-0.7	-2.2
Rubber & Plastic	6.5	6.0	6.3	5.5	7.6	8.4	7.3	-0.3	-2.0
Other Paper	5.7	4.8	5.0	4.3	7.2	8.0	6.7	-0.4	-4.0
Health & Education	5.2	4.8	4.6	5.2	6.2	8.3	5.3	-0.9	-3.5
Pulp & Paper	6.7	5.6	6.2	4.3	8.6	7.9	9.0	0.3	-5.0
Other Elect. Prod.	7.8	7.4	8.2	6.1	9.0	8.4	9.3	0.3	-1.9
Hardware & Cutlery	7.5	6.8	7.6	5.2	8.6	8.0	9.0	0.3	-3.6
Aluminum Rolling	8.5	7.5	8.5	5.5	10.4	8.0	11.5	0.9	-4.4
Other Metal Rolling	10.9	10.7	12.2	7.7	11.9	8.9	13.4	1.2	-1.1
Steel Pipe & Tube	9.6	8.4	9.3	5.5	11.8	8.2	12.9	0.9	-6.6
Motor Vehicles	9.3	6.2	6.9	3.0	11.6	8.0	12.3	0.6	-9.7
M.V. Parts	11.1	9.6	10.7	5.8	13.1	8.5	14.4	1.0	-6.8
Smelting Refining	13.0	10.2	12.1	4.6	14.6	7.7	16.8	1.8	-7.7
Iron & Steel	13.4	11.1	13.3	4.5	14.3	8.0	16.4	1.7	-6.8

6. CONCLUDING REMARKS

It is difficult to quantitatively estimate the economic effects of experience-rating because of the immense nature of the task of constructing a model which must have three key features: general equilibrium, many sectors, and a properly-specified labour market which can capture optimising hiring and firing decisions in various cyclical states of the economy to yield unemployment. The contribution of this paper has been to build a 95-sector general equilibrium model of the Canadian economy with a well-specified labour market.

The model is simulated to provide effects of moving the UI system to the text-book case of full firm-level experience-rating of the UI. Our base case shows that such a move would raise Canadian aggregate real GDP by about 2.2 per cent and reduce the unemployment rate by about 2.2 percentage points. Experience-rating would improve incentives for *all* sectors of the economy at the margin, resulting in a rise in output in most. Albeit, output would decline in some sectors (13 out of 95), yet this would also be accompanied by a decrease in their volatility and an increase in wages.

It needs to be emphasised that demonstrating the potential for gains in an experience-rated system does not suggest that all these gains are realisable because our analysis ignores the administrative complexities and costs of implementing an experience-rated system. In addition, while the analysis is conducted in a firm-level experience-rating framework, a part of the gains should be realisable if experience-rating is introduced on the workers' side, such as the "intensity" rules in the latest Canadian UI reform proposals.

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ANNEX

INDUSTRY EFFECTS OF EXPERIENCE-RATING FOR BASE-CASE AND ALTERNATE SCENARIOS

Table A1: Real Value-Added

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	2.0	2.6	3.3	3.9	4.5
Print & Publish	1.4	2.3	3.1	4.0	4.8
Household Chem.	0.7	1.8	2.9	4.0	5.1
Dist. & Brew.	2.0	2.7	3.4	4.1	4.7
Office Furniture	1.6	2.5	3.3	4.1	5.0
Other Mining	1.7	2.5	3.4	4.3	5.1
Agricultural M & E	1.8	2.6	3.5	4.3	5.1
Oil & Gas Wells	2.2	3.0	3.7	4.4	5.0
Pharmaceutical	1.3	2.3	3.4	4.4	5.4
Metal Stamping	1.9	2.8	3.6	4.4	5.2
Off. & Store M&E	2.2	3.0	3.7	4.4	5.1
Public Administr.	3.2	3.6	4.0	4.4	4.9
Cement & Concrete	1.8	2.7	3.6	4.5	5.3
Mix Fert.& Other Chem.	1.9	2.8	3.7	4.6	5.5
Other Non Metal Minerals	1.7	2.7	3.7	4.7	5.7
Wire	2.3	3.1	3.9	4.7	5.5
Glass	2.0	3.0	3.9	4.9	5.8
Industrial M & E	2.1	3.1	4.0	4.9	5.8
Refineries & Coal Prod	2.9	3.7	4.4	5.1	5.8
Other Metal	2.4	3.3	4.2	5.2	6.1
Health & Education	3.7	4.2	4.7	5.2	5.7
Large Elect.App.	2.9	3.7	4.5	5.3	6.1
Wire And Cable	2.6	3.6	4.5	5.4	6.3
Plastic	2.3	3.4	4.6	5.7	6.8
Aircraft & Parts	3.3	4.1	4.9	5.7	6.5
Other Paper	3.4	4.2	4.9	5.7	6.5
Wineries	3.0	3.9	4.8	5.8	6.7
Electronic Eq.	3.0	4.0	4.9	5.9	6.8
Small Elect.App.	3.2	4.2	5.1	6.0	7.0
Leather Industry	2.3	3.7	5.1	6.5	7.9
Rubber & Plastic	3.3	4.4	5.5	6.5	7.6
Industrial Chem.	3.1	4.3	5.4	6.5	7.7
Pulp & Paper	4.2	5.0	5.9	6.7	7.5
Metal Mining	3.2	4.4	5.5	6.7	7.9
Hardware & Cutlery	5.2	6.0	6.7	7.5	8.2
Other Elect. Prod.	4.2	5.4	6.6	7.8	9.0
Aluminum Rolling	5.9	6.8	7.7	8.5	9.4
Motor Vehicles	8.0	8.5	8.9	9.3	9.8
Steel Pipe & Tube	7.0	7.9	8.7	9.6	10.5
Other Metal Rolling	6.2	7.7	9.3	10.9	12.5
M.V. Parts	9.2	9.9	10.5	11.1	11.7
Smelting Refining	10.4	11.3	12.1	13.0	13.8
Iron & Steel	10.9	11.7	12.6	13.4	14.2

Table A2: Total Output

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	-13.6	-12.8	-12.1	-11.3	-10.6
Fishing	-11.7	-11.1	-10.6	-10.1	-9.6
Retail Trade	-4.4	-4.0	-3.7	-3.4	-3.0
Food & Accomm.	-3.9	-3.4	-3.1	-2.7	-2.4
Personal Services	-3.7	-3.1	-2.7	-2.3	-2.0
Other Agri. Products	-3.8	-2.9	-2.2	-1.7	-1.2
Forestry	-3.4	-2.3	-1.3	-0.3	0.8
Amusement & Rec.	-2.4	-1.7	-1.1	-0.5	-0.1
Hogs & Livestock Co.	-2.8	-2.0	-1.2	-0.4	0.2
Fruits & Vegetables	-2.4	-1.6	-0.8	-0.1	0.5
Engraving	-2.7	-1.7	-0.8	0.1	0.7
Small Grains	-2.4	-1.6	-0.8	-0.1	0.5
Sawmills	-4.2	-3.0	-1.8	-0.7	0.5
Wheat	-1.9	-1.2	-0.5	0.2	0.8
Other Transport	-2.0	-1.2	-0.3	0.5	1.4
Poultry	-1.8	-1.1	-0.4	0.3	0.9
Dairy	-1.1	-0.5	0.2	0.8	1.4
Repair Const.	-0.5	0.1	0.7	1.3	1.8
Res. Const.	-0.1	0.4	0.9	1.5	2.0
Cattle	-0.8	-0.1	0.5	1.1	1.7
Clothing	-1.2	-0.4	0.4	1.2	2.0
Business Services	-0.8	-0.1	0.6	1.2	1.9
Knitting Mills	-0.9	-0.1	0.6	1.4	2.1
Wool Yarn & Cloth	-1.9	-0.8	0.2	1.3	2.4
Non-Res Const.	-0.5	0.3	1.0	1.8	2.5
Other Yarn & Cloth	-1.4	-0.4	0.6	1.7	2.7
Meat Processing	-1.0	-0.3	0.3	1.0	1.6
Shipbuilding	0.3	0.9	1.5	2.1	2.6
Owner Dwelling	0.8	1.1	1.4	1.7	2.0
Bakery & Biscuit	0.0	0.6	1.3	1.9	2.6
Poultry Processing	-0.1	0.5	1.0	1.6	2.1
Other Furniture	-0.6	0.3	1.2	2.1	3.1
Other Wood	-1.2	-0.1	0.9	2.0	3.1
Dairy Processing	0.1	0.7	1.3	1.8	2.4
Veneer Plywood & Other	-0.2	0.7	1.5	2.3	3.2
F.I.R.E.	0.3	1.1	1.7	2.4	3.1
Wholesale Trade	0.6	1.3	2.0	2.7	3.4
Boiler & Struct. Metal	0.6	1.4	2.2	3.0	3.8
Communications	0.5	1.3	1.9	2.6	3.3
Feed Industry	-0.3	0.4	1.1	1.8	2.4
Architect. Metal	0.8	1.5	2.2	2.9	3.6
Other Textiles	0.6	1.4	2.1	2.8	3.5
Truck Transport.	0.9	1.6	2.2	2.8	3.4
Air Transport.	0.9	1.5	2.0	2.6	3.1
Oth Trans. & Stor.	1.1	1.7	2.3	2.9	3.5
Rail Transport.	1.1	1.7	2.2	2.8	3.4
Sport And Toy Industry	1.0	1.7	2.4	3.1	3.8
Misc. Food	1.1	1.7	2.3	2.9	3.5
Fruit Vegetables	1.0	1.7	2.4	3.1	3.8
Public Utilities	1.6	2.2	2.9	3.5	4.1
Tobacco	1.7	2.2	2.7	3.2	3.7
Misc. Manu.	1.2	2.0	2.7	3.5	4.3

Table A2: Total Output

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	1.6	2.3	2.8	3.4	4.1
Print & Publish	1.3	2.2	3.0	3.8	4.6
Household Chem.	0.6	1.8	2.8	3.9	5.0
Dist. & Brew.	1.7	2.4	3.0	3.7	4.4
Office Furniture	1.3	2.2	3.0	3.8	4.6
Other Mining	1.4	2.2	3.1	3.9	4.8
Agricultural M & E	1.6	2.5	3.3	4.0	4.8
Oil & Gas Wells	1.8	2.5	3.3	4.0	4.7
Pharmaceutical	1.1	2.2	3.2	4.2	5.2
Metal Stamping	2.1	2.9	3.6	4.4	5.2
Off. & Store M&E	1.7	2.4	3.0	3.7	4.4
Public Administr.	2.5	3.0	3.4	3.9	4.4
Cement & Concrete	1.4	2.3	3.1	4.0	4.9
Mix Fert.& Other Chem.	1.6	2.5	3.3	4.2	5.0
Other Non Metal Minerals	1.6	2.6	3.5	4.5	5.4
Wire	2.1	2.9	3.7	4.5	5.3
Glass	1.8	2.8	3.7	4.6	5.6
Industrial M & E	2.0	2.9	3.8	4.7	5.6
Refineries & Coal Prod	1.4	2.1	2.7	3.4	4.0
Other Metal	2.4	3.4	4.3	5.2	6.1
Health & Education	3.2	3.7	4.3	4.8	5.3
Large Elect.App.	2.3	3.1	3.9	4.6	5.4
Wire And Cable	2.4	3.3	4.2	5.1	5.9
Plastic	2.2	3.3	4.4	5.5	6.6
Aircraft & Parts	2.9	3.7	4.5	5.3	6.0
Other Paper	2.5	3.3	4.0	4.8	5.5
Wineries	2.4	3.4	4.3	5.2	6.1
Electronic Eq.	2.6	3.6	4.5	5.4	6.3
Small Elect.App.	2.8	3.8	4.7	5.6	6.5
Leather Industry	1.9	3.3	4.7	6.1	7.5
Rubber & Plastic	2.9	3.9	5.0	6.0	7.1
Industrial Chem.	2.7	3.9	5.0	6.1	7.2
Pulp & Paper	3.1	4.0	4.8	5.6	6.4
Metal Mining	3.1	4.3	5.4	6.6	7.8
Hardware & Cutlery	4.5	5.3	6.0	6.8	7.6
Other Elect. Prod.	3.8	5.1	6.2	7.4	8.6
Aluminum Rolling	5.0	5.8	6.7	7.5	8.3
Motor Vehicles	5.0	5.4	5.8	6.2	6.6
Steel Pipe & Tube	5.8	6.7	7.5	8.4	9.2
Other Metal Rolling	5.9	7.5	9.1	10.7	12.3
M.V. Parts	7.9	8.5	9.0	9.6	10.2
Smelting Refining	7.7	8.6	9.4	10.2	11.1
Iron & Steel	8.5	9.4	10.2	11.1	11.9

Table A3: High-Demand Output

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	0.0125	0.025	0.0375	0.05
Fish Processing	-21.5	-21.2	-21.0	-20.8	-20.6
Fishing	-18.9	-18.4	-17.9	-17.4	-17.0
Retail Trade	-8.8	-8.6	-8.3	-7.9	-7.6
Food & Accomm.	-8.2	-8.0	-7.6	-7.3	-6.9
Personal Services	-8.1	-8.4	-8.2	-7.9	-7.6
Other Agri. Products	-7.0	-6.7	-6.3	-5.9	-5.5
Forestry	-6.0	-5.5	-5.0	-4.5	-4.1
Amusement & Rec.	-3.7	-3.3	-3.1	-2.9	-2.6
Hogs & Livestock Co.	-4.1	-3.4	-2.8	-2.1	-1.6
Fruits & Vegetables	-4.2	-3.6	-3.2	-2.7	-2.2
Engraving	-4.6	-4.3	-4.1	-3.9	-3.4
Small Grains	-3.8	-3.3	-2.7	-2.2	-1.8
Sawmills	-5.7	-4.9	-4.2	-3.5	-2.9
Wheat	-2.8	-2.2	-1.6	-1.0	-0.5
Other Transport	-3.6	-3.2	-2.9	-2.6	-2.2
Poultry	-2.7	-2.1	-1.5	-0.9	-0.4
Dairy	-2.0	-1.5	-1.1	-0.7	-0.2
Repair Const.	-1.2	-1.4	-1.7	-2.0	-2.3
Res. Const.	-0.7	-0.9	-1.2	-1.4	-1.7
Cattle	-1.3	-0.8	-0.3	0.2	0.7
Clothing	-2.0	-1.7	-1.5	-1.3	-1.1
Business Services	-1.4	-1.5	-1.6	-1.7	-1.8
Knitting Mills	-1.6	-1.3	-1.1	-0.8	-0.6
Wool Yarn & Cloth	-2.8	-2.2	-1.5	-0.9	-0.3
Non-Res Const.	-1.2	-1.0	-0.9	-0.9	-0.8
Other Yarn & Cloth	-2.2	-1.5	-0.8	-0.1	0.6
Meat Processing	-1.3	-1.0	-0.8	-0.6	-0.4
Shipbuilding	0.2	0.1	-0.1	-0.4	-0.6
Owner Dwelling	0.8	1.1	1.4	1.7	2.0
Bakery & Biscuit	-0.3	0.0	0.1	0.3	0.5
Poultry Processing	-0.1	0.0	0.0	0.1	0.1
Other Furniture	-1.0	-0.5	-0.1	0.3	0.7
Other Wood	-1.6	-0.9	-0.3	0.3	0.9
Dairy Processing	0.3	0.7	1.0	1.3	1.6
Veneer Plywood & Other	-0.2	0.2	0.6	0.9	1.3
F.I.R.E.	0.5	0.8	1.1	1.3	1.6
Wholesale Trade	1.0	1.1	1.1	1.2	1.2
Boiler & Struct. Metal	0.6	1.0	1.3	1.6	1.9
Communications	0.8	1.2	1.5	1.8	2.0
Feed Industry	0.2	0.6	1.1	1.5	1.9
Architect. Metal	1.1	1.3	1.5	1.6	1.8
Other Textiles	1.0	1.2	1.4	1.6	1.8
Truck Transport.	1.5	1.7	1.9	2.1	2.2
Air Transport.	1.7	1.6	1.5	1.4	1.2
Oth Trans. & Stor.	1.6	1.8	2.0	2.1	2.3
Rail Transport.	1.8	1.8	1.8	1.7	1.7
Sport And Toy Industry	1.5	1.8	2.0	2.2	2.5
Misc. Food	1.7	2.1	2.4	2.8	3.1
Fruit Vegetables	1.4	1.9	2.4	2.9	3.3
Public Utilities	2.0	2.5	3.0	3.5	4.0
Tobacco	2.3	2.7	3.1	3.5	3.8
Misc. Manu.	1.8	2.1	2.4	2.6	2.8
Footwear Industry	2.5	2.6	2.6	2.7	2.7

Table A3: High-Demand Output

(per cent change shock minus control)

	0	0.0125	0.025	0.0375	0.05
Fish Processing	-21.5	-21.2	-21.0	-20.8	-20.6
Fishing	-18.9	-18.4	-17.9	-17.4	-17.0
Retail Trade	-8.8	-8.6	-8.3	-7.9	-7.6
Food & Accomm.	-8.2	-8.0	-7.6	-7.3	-6.9
Personal Services	-8.1	-8.4	-8.2	-7.9	-7.6
Print & Publish	2.0	2.4	2.8	3.2	3.6
Household Chem.	0.9	1.8	2.6	3.4	4.1
Dist. & Brew.	2.3	2.8	3.3	3.7	4.2
Office Furniture	1.9	2.4	2.8	3.3	3.7
Other Mining	2.0	2.6	3.1	3.6	4.2
Agricultural M & E	2.2	2.7	3.2	3.6	4.1
Oil & Gas Wells	2.3	3.0	3.6	4.3	4.9
Pharmaceutical	1.5	2.4	3.2	4.1	4.9
Metal Stamping	2.8	3.2	3.5	3.8	4.2
Off. & Store M&E	2.6	2.9	3.2	3.5	3.8
Public Administr.	4.3	4.0	3.7	3.4	3.1
Cement & Concrete	2.1	2.7	3.3	3.8	4.4
Mix Fert.& Other Chem.	2.3	3.0	3.6	4.2	4.8
Other Non Metal Minerals	2.2	2.9	3.5	4.2	4.8
Wire	3.1	3.4	3.7	4.0	4.2
Glass	2.6	3.2	3.7	4.3	4.8
Industrial M & E	2.8	3.4	3.8	4.3	4.8
Refineries & Coal Prod	2.7	3.2	3.6	4.0	4.4
Other Metal	3.4	3.9	4.3	4.7	5.1
Health & Education	4.7	4.7	4.7	4.6	4.5
Large Elect.App.	3.5	3.9	4.3	4.6	5.0
Wire And Cable	3.2	3.9	4.5	5.1	5.8
Plastic	2.8	3.7	4.7	5.6	6.6
Aircraft & Parts	4.3	4.7	5.0	5.3	5.6
Other Paper	3.8	4.3	4.7	5.0	5.4
Wineries	3.4	4.2	4.8	5.5	6.2
Electronic Eq.	3.8	4.4	5.0	5.5	6.1
Small Elect.App.	4.1	4.7	5.2	5.8	6.3
Leather Industry	2.8	4.0	5.1	6.2	7.3
Rubber & Plastic	4.2	5.0	5.6	6.3	7.0
Industrial Chem.	3.7	4.7	5.7	6.6	7.6
Pulp & Paper	4.4	5.0	5.6	6.2	6.8
Metal Mining	3.8	4.9	5.9	7.0	8.0
Hardware & Cutlery	6.6	7.0	7.3	7.6	7.9
Other Elect. Prod.	5.5	6.4	7.3	8.2	9.0
Aluminum Rolling	6.6	7.3	7.9	8.5	9.1
Motor Vehicles	6.2	6.4	6.6	6.9	7.1
Steel Pipe & Tube	7.3	8.0	8.7	9.3	10.0
Other Metal Rolling	8.0	9.5	10.8	12.2	13.6
M.V. Parts	9.7	10.1	10.4	10.7	11.0
Smelting Refining	10.3	10.9	11.5	12.1	12.7
Iron & Steel	11.7	12.3	12.8	13.3	13.9

Table A4: Low-Demand Output

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	-2.7	-1.2	1.7	1.8	3.4
Fishing	-4.2	-3.6	4.7	-2.6	-2.0
Retail Trade	0.8	1.5	1.5	2.1	2.5
Food & Accomm.	1.1	1.8	3.7	2.5	2.8
Personal Services	1.2	3.1	3.6	4.1	4.5
Other Agri. Products	-0.1	1.3	3.6	3.2	3.7
Forestry	0.1	1.9	-3.1	5.4	7.3
Amusement & Rec.	-0.6	0.6	3.8	2.8	3.3
Hogs & Livestock Co.	-1.5	-0.4	0.8	1.6	2.3
Fruits & Vegetables	-0.5	0.7	1.4	2.9	3.5
Engraving	0.1	2.0	2.7	5.7	6.5
Small Grains	-0.8	0.3	2.6	2.4	3.0
Sawmills	-1.5	0.5	3.1	4.5	6.6
Wheat	-1.0	-0.1	1.3	1.6	2.4
Other Transport	-0.1	1.4	3.7	4.3	5.8
Poultry	-0.9	0.0	1.8	1.7	2.4
Dairy	-0.1	0.8	0.8	2.4	3.2
Repair Const.	0.6	2.5	4.2	6.4	8.5
Res. Const.	0.9	2.5	4.2	6.0	7.7
Cattle	-0.1	0.7	0.6	2.1	2.9
Clothing	0.1	1.7	2.5	5.1	6.8
Business Services	0.1	1.9	2.1	5.7	7.4
Knitting Mills	0.2	1.7	3.4	4.9	6.4
Wool Yarn & Cloth	-0.3	1.4	2.9	4.8	6.6
Non-Res Const.	0.7	2.4	2.9	6.0	7.8
Other Yarn & Cloth	-0.3	1.3	3.2	4.4	6.0
Meat Processing	-0.7	0.8	2.7	3.6	5.0
Shipbuilding	0.3	2.2	2.8	6.0	8.0
Owner Dwelling	0.9	1.2	2.7	1.7	2.0
Bakery & Biscuit	0.3	1.6	2.0	4.3	5.7
Poultry Processing	-0.1	1.3	0.3	4.2	5.6
Other Furniture	0.1	1.9	3.0	5.6	7.5
Other Wood	-0.6	1.3	3.7	5.1	7.1
Dairy Processing	-0.3	0.7	2.4	2.7	3.6
Veneer Plywood & Other	-0.2	1.5	3.2	4.8	6.6
F.I.R.E.	0.2	1.4	3.4	4.0	5.2
Wholesale Trade	0.1	1.7	1.8	4.9	6.5
Boiler & Struct. Metal	0.5	2.1	3.5	5.4	7.0
Communications	0.1	1.4	2.6	3.9	5.1
Feed Industry	-1.1	0.0	3.0	2.3	3.4
Architect. Metal	0.4	1.9	3.9	5.1	6.7
Other Textiles	0.0	1.6	3.3	4.8	6.5
Truck Transport.	0.1	1.4	2.9	4.1	5.5
Air Transport.	-0.5	1.2	3.0	4.6	6.3
Oth Trans. & Stor.	0.1	1.5	2.6	4.3	5.6
Rail Transport.	-0.2	1.4	2.8	4.7	6.3
Sport And Toy Industry	0.2	1.7	3.3	4.5	6.0
Misc. Food	0.0	1.0	2.7	3.1	4.0
Fruit Vegetables	0.2	1.3	1.2	3.6	4.7
Public Utilities	0.9	1.8	3.0	3.5	4.3
Tobacco	0.5	1.3	3.8	2.8	3.5
Misc. Manu.	0.2	1.7	1.6	5.0	6.6
Footwear Industry	0.0	1.6	3.9	4.9	6.6

Table A4: Low-Demand Output

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Print & Publish	0.3	1.8	3.9	4.7	6.2
Household Chem.	0.3	1.8	4.0	4.7	6.2
Dist. & Brew.	0.6	1.7	3.4	3.7	4.7
Office Furniture	0.2	1.7	2.9	4.8	6.4
Other Mining	0.3	1.7	4.5	4.5	5.9
Agricultural M & E	0.5	1.9	3.7	4.8	6.3
Oil & Gas Wells	0.8	1.7	3.1	3.4	4.3
Pharmaceutical	0.6	1.9	3.2	4.4	5.7
Metal Stamping	0.9	2.4	3.7	5.4	6.9
Off. & Store M&E	0.2	1.5	3.6	4.1	5.4
Public Administr.	-0.5	1.2	3.3	4.7	6.5
Cement & Concrete	0.1	1.5	3.7	4.3	5.7
Mix Fert.& Other Chem.	0.4	1.7	4.0	4.2	5.4
Other Non Metal Minerals	0.6	2.1	1.7	5.1	6.6
Wire	0.4	2.0	3.6	5.4	7.1
Glass	0.4	2.0	3.6	5.4	7.1
Industrial M & E	0.5	2.1	2.8	5.3	6.9
Refineries & Coal Prod	-0.2	0.8	3.2	2.6	3.6
Other Metal	0.6	2.4	3.4	5.9	7.8
Health & Education	-0.1	1.6	1.7	5.2	7.0
Large Elect.App.	0.4	1.8	3.6	4.6	6.1
Wire And Cable	0.9	2.3	2.9	4.9	6.3
Plastic	1.3	2.6	3.1	5.3	6.6
Aircraft & Parts	0.5	2.0	1.8	5.1	6.7
Other Paper	0.0	1.4	3.2	4.3	5.8
Wineries	0.7	2.0	2.1	4.7	6.0
Electronic Eq.	0.7	2.1	4.3	5.1	6.6
Small Elect.App.	0.6	2.1	3.2	5.2	6.7
Leather Industry	0.1	2.0	3.1	5.8	7.8
Rubber & Plastic	0.5	2.1	3.3	5.5	7.2
Industrial Chem.	1.3	2.6	3.1	5.3	6.7
Pulp & Paper	0.3	1.6	2.9	4.3	5.6
Metal Mining	1.9	3.3	2.6	6.1	7.5
Hardware & Cutlery	0.3	1.9	4.1	5.2	6.9
Other Elect. Prod.	0.9	2.6	3.6	6.1	7.8
Aluminum Rolling	1.6	2.9	5.7	5.5	6.8
Motor Vehicles	-0.6	0.6	4.4	3.0	4.2
Steel Pipe & Tube	1.3	2.7	3.1	5.5	6.9
Other Metal Rolling	1.9	3.8	3.7	7.7	9.7
M.V. Parts	1.5	2.9	4.1	5.8	7.2
Smelting Refining	0.1	1.6	4.2	4.6	6.1
Iron & Steel	-0.8	1.0	4.1	4.5	6.4

Table A5: Capital

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	-9.4	-8.5	-7.6	-6.7	-5.8
Fishing	-9.8	-9.2	-8.7	-8.3	-7.8
Retail Trade	-1.6	-1.3	-0.9	-0.6	-0.3
Food & Accomm.	-1.4	-1.0	-0.7	-0.3	0.0
Personal Services	-1.2	-0.6	-0.2	0.1	0.4
Other Agri. Products	-2.5	-1.7	-1.1	-0.6	-0.2
Forestry	-2.0	-1.0	0.0	1.0	2.0
Amusement & Rec.	-1.4	-0.8	-0.4	0.1	0.4
Hogs & Livestock Co.	-2.3	-1.5	-0.8	-0.1	0.4
Fruits & Vegetables	-1.6	-0.9	-0.2	0.4	0.9
Engraving	-1.8	-0.9	0.0	0.9	1.4
Small Grains	-1.5	-0.9	-0.2	0.4	0.9
Sawmills	-3.5	-2.4	-1.3	-0.2	1.0
Wheat	-1.5	-0.8	-0.2	0.4	0.9
Other Transport	-1.5	-0.7	0.0	0.8	1.6
Poultry	-1.3	-0.7	-0.1	0.5	1.0
Dairy	-0.4	0.1	0.6	1.1	1.6
Repair Const.	0.4	1.0	1.6	2.2	2.8
Res. Const.	0.5	1.0	1.4	1.9	2.4
Cattle	-0.3	0.2	0.7	1.2	1.7
Clothing	-0.7	0.0	0.7	1.4	2.2
Business Services	0.0	0.6	1.2	1.9	2.5
Knitting Mills	-0.5	0.2	0.9	1.6	2.2
Wool Yarn & Cloth	-1.3	-0.4	0.6	1.6	2.6
Non-Res Const.	0.2	0.9	1.6	2.3	3.0
Other Yarn & Cloth	-1.1	-0.2	0.8	1.7	2.7
Meat Processing	-0.6	-0.1	0.5	1.1	1.6
Shipbuilding	0.4	1.0	1.6	2.2	2.8
Owner Dwelling	0.9	1.2	1.5	1.7	2.0
Bakery & Biscuit	0.2	0.8	1.3	1.8	2.3
Poultry Processing	0.2	0.7	1.1	1.6	2.1
Other Furniture	-0.4	0.5	1.3	2.2	3.1
Other Wood	-1.0	0.0	1.0	2.1	3.1
Dairy Processing	0.3	0.8	1.3	1.7	2.2
Veneer Plywood & Other	0.0	0.7	1.5	2.3	3.0
F.I.R.E.	0.6	1.1	1.7	2.2	2.8
Wholesale Trade	0.7	1.3	1.9	2.5	3.1
Boiler & Struct. Metal	0.6	1.3	2.0	2.8	3.5
Communications	0.6	1.2	1.7	2.3	2.8
Feed Industry	-0.4	0.2	0.8	1.4	2.0
Architect. Metal	0.7	1.3	1.9	2.5	3.2
Other Textiles	0.6	1.3	1.9	2.6	3.2
Truck Transport.	0.8	1.3	1.9	2.4	2.9
Air Transport.	0.8	1.3	1.8	2.3	2.8
Oth Trans. & Stor.	0.9	1.4	1.9	2.4	2.9
Rail Transport.	0.9	1.4	1.9	2.4	2.9
Sport And Toy Industry	0.9	1.5	2.1	2.8	3.4
Misc. Food	0.9	1.4	1.9	2.4	2.9
Fruit Vegetables	0.9	1.5	2.1	2.7	3.3
Public Utilities	1.4	1.9	2.4	3.0	3.5
Tobacco	1.4	1.8	2.2	2.6	3.0
Misc. Manu.	1.1	1.8	2.5	3.2	3.9

Table A5: Capital

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	1.4	1.9	2.5	3.0	3.6
Print & Publish	1.1	1.9	2.6	3.3	4.0
Household Chem.	0.7	1.7	2.7	3.7	4.7
Dist. & Brew.	1.4	2.0	2.6	3.1	3.7
Office Furniture	1.1	1.9	2.6	3.3	4.0
Other Mining	1.2	2.0	2.7	3.5	4.3
Agricultural M & E	1.4	2.1	2.8	3.5	4.2
Oil & Gas Wells	1.5	2.2	2.9	3.5	4.1
Pharmaceutical	1.1	2.1	3.0	3.9	4.8
Metal Stamping	1.9	2.6	3.3	3.9	4.6
Off. & Store M&E	1.5	2.1	2.7	3.3	3.9
Public Administr.	1.5	2.0	2.4	2.9	3.4
Cement & Concrete	1.1	1.9	2.6	3.4	4.2
Mix Fert.& Other Chem.	1.3	2.1	2.9	3.7	4.5
Other Non Metal Minerals	1.5	2.4	3.2	4.1	5.0
Wire	1.8	2.5	3.2	3.9	4.7
Glass	1.7	2.5	3.4	4.2	5.1
Industrial M & E	1.7	2.5	3.3	4.2	5.0
Refineries & Coal Prod	1.2	1.8	2.4	3.0	3.5
Other Metal	2.2	3.0	3.9	4.7	5.6
Health & Education	2.1	2.5	3.0	3.5	4.0
Large Elect.App.	2.1	2.8	3.5	4.1	4.8
Wire And Cable	2.1	2.9	3.7	4.5	5.4
Plastic	2.1	3.1	4.1	5.2	6.2
Aircraft & Parts	2.4	3.2	3.9	4.6	5.3
Other Paper	1.9	2.6	3.3	3.9	4.6
Wineries	2.2	3.0	3.8	4.7	5.5
Electronic Eq.	2.3	3.2	4.0	4.8	5.7
Small Elect.App.	2.5	3.3	4.1	5.0	5.8
Leather Industry	1.7	3.1	4.4	5.7	7.1
Rubber & Plastic	2.6	3.6	4.5	5.5	6.5
Industrial Chem.	2.5	3.6	4.6	5.7	6.7
Pulp & Paper	2.6	3.4	4.1	4.8	5.6
Metal Mining	3.0	4.1	5.2	6.3	7.3
Hardware & Cutlery	3.5	4.2	4.9	5.6	6.3
Other Elect. Prod.	3.5	4.6	5.7	6.8	7.9
Aluminum Rolling	4.5	5.3	6.0	6.8	7.6
Motor Vehicles	4.3	4.6	5.0	5.4	5.7
Steel Pipe & Tube	4.8	5.6	6.3	7.1	7.9
Other Metal Rolling	5.6	7.2	8.6	10.1	11.7
M.V. Parts	6.8	7.3	7.8	8.3	8.8
Smelting Refining	6.9	7.7	8.4	9.2	9.9
Iron & Steel	7.1	7.9	8.7	9.5	10.3

Table A6: Total Employment

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	-17.2	-15.9	-14.7	-13.4	-12.2
Fishing	-14.0	-13.4	-13.0	-12.5	-12.1
Retail Trade	-6.7	-6.3	-6.0	-5.7	-5.5
Food & Accomm.	-6.7	-6.3	-6.0	-5.7	-5.4
Personal Services	-6.2	-5.1	-4.9	-4.6	-4.3
Other Agri. Products	-7.1	-5.6	-4.3	-4.0	-3.7
Forestry	-4.8	-3.4	-1.9	-0.5	1.0
Amusement & Rec.	-4.3	-3.0	-1.8	-0.6	-0.4
Hogs & Livestock Co.	-5.8	-4.2	-2.7	-1.1	-0.4
Fruits & Vegetables	-5.8	-4.2	-2.7	-1.2	-0.8
Engraving	-3.4	-2.1	-0.8	0.4	0.8
Small Grains	-5.6	-4.0	-2.5	-1.0	-0.4
Sawmills	-3.4	-1.9	-0.6	0.8	2.2
Wheat	-5.2	-3.7	-2.1	-0.6	0.6
Other Transport	-3.0	-1.7	-0.4	1.0	2.3
Poultry	-5.2	-3.6	-2.1	-0.5	0.7
Dairy	-4.7	-3.2	-1.7	-0.3	1.0
Repair Const.	-1.3	-0.4	0.5	1.5	2.4
Res. Const.	-1.2	-0.3	0.6	1.5	2.4
Cattle	-4.5	-3.0	-1.4	0.1	1.5
Clothing	-1.8	-0.7	0.5	1.7	2.9
Business Services	-1.0	0.0	1.0	2.0	3.0
Knitting Mills	-1.6	-0.4	0.7	1.9	3.1
Wool Yarn & Cloth	-2.4	-0.9	0.5	1.9	3.4
Non-Res Const.	-1.4	-0.3	0.8	1.9	3.0
Other Yarn & Cloth	-2.1	-0.6	0.8	2.3	3.7
Meat Processing	-0.6	0.4	1.5	2.6	3.6
Shipbuilding	0.0	0.9	1.7	2.7	3.6
Owner Dwelling	0.0	0.0	0.0	0.0	0.0
Bakery & Biscuit	-0.5	0.6	1.7	2.8	3.9
Poultry Processing	0.0	1.0	2.0	2.9	3.9
Other Furniture	-0.9	0.3	1.5	2.8	4.0
Other Wood	-0.9	0.5	1.8	3.1	4.5
Dairy Processing	1.0	2.1	3.1	4.2	5.2
Veneer Plywood & Other	0.0	1.2	2.3	3.5	4.6
F.I.R.E.	0.4	1.5	2.7	3.9	5.0
Wholesale Trade	0.7	1.8	2.8	3.9	5.0
Boiler & Struct. Metal	0.1	1.3	2.5	3.7	4.9
Communications	0.7	1.9	3.1	4.3	5.4
Feed Industry	1.5	2.6	3.8	4.8	5.9
Architect. Metal	0.7	1.8	2.8	3.9	4.9
Other Textiles	0.9	2.0	3.0	4.1	5.2
Truck Transport.	1.4	2.5	3.5	4.5	5.5
Air Transport.	1.6	2.5	3.4	4.2	5.1
Oth Trans. & Stor.	1.5	2.5	3.5	4.5	5.5
Rail Transport.	1.7	2.6	3.5	4.3	5.2
Sport And Toy Industry	1.2	2.3	3.4	4.6	5.7
Misc. Food	2.5	3.6	4.6	5.7	6.7
Fruit Vegetables	1.8	3.0	4.2	5.4	6.5
Public Utilities	2.7	3.9	5.0	6.2	7.3
Tobacco	3.8	4.8	5.8	6.8	7.7
Misc. Manu.	1.4	2.6	3.7	4.8	6.0

Table A6: Total Employment

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	2.1	3.1	4.0	4.9	5.8
Print & Publish	1.5	2.8	4.0	5.2	6.5
Household Chem.	0.7	2.3	3.8	5.3	6.8
Dist. & Brew.	2.8	4.0	5.1	6.2	7.3
Office Furniture	1.9	3.0	4.2	5.3	6.5
Other Mining	1.9	3.2	4.4	5.6	6.9
Agricultural M & E	2.1	3.2	4.4	5.5	6.7
Oil & Gas Wells	4.4	5.6	6.8	7.9	9.0
Pharmaceutical	1.5	3.0	4.5	6.0	7.5
Metal Stamping	2.0	3.2	4.3	5.5	6.7
Off. & Store M&E	2.6	3.7	4.8	5.9	7.0
Public Administr.	3.2	3.9	4.7	5.4	6.2
Cement & Concrete	2.3	3.5	4.8	6.0	7.2
Mix Fert.& Other Chem.	2.4	3.7	5.0	6.3	7.6
Other Non Metal Minerals	1.9	3.3	4.6	5.9	7.2
Wire	2.4	3.5	4.6	5.7	6.9
Glass	2.2	3.4	4.7	5.9	7.2
Industrial M & E	2.3	3.6	4.8	6.0	7.3
Refineries & Coal Prod	3.5	4.7	5.8	6.9	8.0
Other Metal	2.4	3.7	4.9	6.1	7.4
Health & Education	3.9	4.7	5.5	6.2	7.0
Large Elect.App.	3.2	4.3	5.5	6.6	7.8
Wire And Cable	3.0	4.3	5.6	6.9	8.3
Plastic	2.6	4.2	5.7	7.3	8.9
Aircraft & Parts	3.5	4.6	5.7	6.9	8.0
Other Paper	4.0	5.0	6.1	7.2	8.2
Wineries	3.6	4.9	6.2	7.5	8.8
Electronic Eq.	3.3	4.7	5.9	7.2	8.5
Small Elect.App.	3.5	4.8	6.1	7.3	8.6
Leather Industry	2.5	4.1	5.8	7.4	9.1
Rubber & Plastic	3.5	4.9	6.3	7.6	9.0
Industrial Chem.	3.8	5.3	6.9	8.4	10.0
Pulp & Paper	5.2	6.4	7.5	8.6	9.8
Metal Mining	3.4	5.0	6.6	8.3	9.9
Hardware & Cutlery	5.5	6.5	7.6	8.6	9.7
Other Elect. Prod.	4.4	6.0	7.4	9.0	10.5
Aluminum Rolling	6.8	8.0	9.2	10.4	11.6
Motor Vehicles	9.8	10.4	11.0	11.6	12.2
Steel Pipe & Tube	8.5	9.6	10.7	11.8	12.9
Other Metal Rolling	6.3	8.2	10.0	11.9	13.8
M.V. Parts	10.7	11.5	12.3	13.1	13.9
Smelting Refining	11.5	12.5	13.5	14.6	15.6
Iron & Steel	11.3	12.3	13.3	14.3	15.4

Table A7: Labour Force in High-Demand Period

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	-27.8	-27.6	-27.5	-27.4	-27.3
Fishing	-25.5	-25.0	-24.6	-24.2	-23.8
Retail Trade	-11.8	-11.6	-11.3	-11.1	-10.8
Food & Accomm.	-12.0	-11.8	-11.5	-11.2	-11.0
Personal Services	-11.2	-11.7	-11.6	-11.3	-11.0
Other Agri. Products	-12.5	-12.3	-12.1	-11.8	-11.5
Forestry	-8.1	-7.7	-7.4	-7.1	-6.7
Amusement & Rec.	-7.0	-6.9	-6.8	-6.8	-6.5
Hogs & Livestock Co.	-10.4	-9.8	-9.4	-8.9	-8.5
Fruits & Vegetables	-10.2	-9.9	-9.5	-9.2	-8.9
Engraving	-5.7	-5.5	-5.3	-5.2	-4.8
Small Grains	-9.9	-9.5	-9.2	-8.8	-8.5
Sawmills	-5.1	-4.4	-3.8	-3.2	-2.6
Wheat	-9.3	-8.8	-8.4	-8.0	-7.6
Other Transport	-5.4	-5.1	-4.9	-4.7	-4.5
Poultry	-9.1	-8.7	-8.3	-7.9	-7.5
Dairy	-8.4	-8.1	-7.8	-7.5	-7.2
Repair Const.	-2.0	-2.3	-2.7	-3.1	-3.5
Res. Const.	-1.9	-2.2	-2.5	-2.9	-3.3
Cattle	-8.0	-7.6	-7.2	-6.9	-6.5
Clothing	-2.9	-2.7	-2.6	-2.5	-2.4
Business Services	-1.7	-1.9	-2.1	-2.4	-2.6
Knitting Mills	-2.6	-2.4	-2.3	-2.2	-2.0
Wool Yarn & Cloth	-3.7	-3.2	-2.7	-2.1	-1.6
Non-Res Const.	-2.3	-2.2	-2.3	-2.3	-2.3
Other Yarn & Cloth	-3.3	-2.7	-2.1	-1.5	-1.0
Meat Processing	-1.0	-0.8	-0.8	-0.7	-0.6
Shipbuilding	-0.1	-0.3	-0.6	-0.9	-1.2
Owner Dwelling	0.0	0.0	0.0	0.0	0.0
Bakery & Biscuit	-0.9	-0.8	-0.8	-0.7	-0.7
Poultry Processing	0.0	0.0	-0.1	-0.2	-0.3
Other Furniture	-1.3	-1.0	-0.6	-0.3	-0.1
Other Wood	-1.3	-0.7	-0.2	0.3	0.8
Dairy Processing	1.5	1.8	1.9	2.1	2.3
Veneer Plywood & Other	0.0	0.3	0.6	0.8	1.1
F.I.R.E.	0.6	0.8	0.9	1.0	1.1
Wholesale Trade	1.2	1.1	1.0	0.9	0.8
Boiler & Struct. Metal	0.2	0.4	0.6	0.8	1.0
Communications	1.2	1.4	1.6	1.7	1.8
Feed Industry	2.3	2.7	3.0	3.4	3.6
Architect. Metal	1.1	1.2	1.3	1.3	1.4
Other Textiles	1.4	1.6	1.7	1.8	1.9
Truck Transport.	2.2	2.3	2.4	2.4	2.5
Air Transport.	2.5	2.4	2.2	2.0	1.7
Oth Trans. & Stor.	2.4	2.4	2.4	2.5	2.5
Rail Transport.	2.6	2.5	2.3	2.2	2.0
Sport And Toy Industry	2.0	2.1	2.2	2.3	2.4
Misc. Food	3.8	4.1	4.3	4.6	4.8
Fruit Vegetables	2.8	3.2	3.6	3.9	4.3
Public Utilities	4.2	4.6	4.9	5.3	5.7
Tobacco	5.9	6.2	6.4	6.7	6.9
Misc. Manu.	2.3	2.5	2.6	2.7	2.8

Table A7: Labour Force in High-Demand Period

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	3.2	3.2	3.2	3.1	3.1
Print & Publish	2.6	2.9	3.1	3.4	3.6
Household Chem.	1.2	2.0	2.7	3.3	4.0
Dist. & Brew.	4.4	4.7	5.1	5.4	5.7
Office Furniture	2.7	3.1	3.4	3.8	4.1
Other Mining	3.0	3.4	3.9	4.3	4.7
Agricultural M & E	3.0	3.4	3.8	4.1	4.5
Oil & Gas Wells	6.7	7.3	7.9	8.4	9.0
Pharmaceutical	2.5	3.3	4.0	4.7	5.4
Metal Stamping	3.0	3.3	3.6	3.8	4.0
Off. & Store M&E	4.0	4.3	4.5	4.7	4.9
Public Administr.	5.2	4.8	4.4	4.0	3.6
Cement & Concrete	3.5	4.0	4.4	4.9	5.3
Mix Fert.& Other Chem.	3.9	4.5	5.0	5.5	5.9
Other Non Metal Minerals	2.9	3.5	4.0	4.5	5.1
Wire	3.7	3.9	4.1	4.2	4.4
Glass	3.2	3.7	4.2	4.6	5.0
Industrial M & E	3.5	4.0	4.3	4.7	5.1
Refineries & Coal Prod	6.1	6.5	6.8	7.1	7.4
Other Metal	3.7	4.1	4.4	4.7	5.0
Health & Education	5.7	5.6	5.5	5.3	5.1
Large Elect.App.	4.9	5.2	5.5	5.8	6.1
Wire And Cable	4.6	5.2	5.7	6.3	6.8
Plastic	4.2	5.1	5.9	6.8	7.6
Aircraft & Parts	5.4	5.7	5.9	6.1	6.3
Other Paper	5.8	6.2	6.5	6.7	7.0
Wineries	5.5	6.1	6.7	7.3	7.8
Electronic Eq.	5.2	5.7	6.2	6.7	7.2
Small Elect.App.	5.4	5.9	6.4	6.8	7.3
Leather Industry	3.6	4.8	5.8	6.8	7.8
Rubber & Plastic	5.4	6.1	6.7	7.3	7.8
Industrial Chem.	6.2	7.1	8.0	8.9	9.8
Pulp & Paper	7.5	8.0	8.5	9.0	9.4
Metal Mining	5.4	6.4	7.4	8.3	9.2
Hardware & Cutlery	8.2	8.5	8.7	9.0	9.2
Other Elect. Prod.	6.9	7.7	8.5	9.3	10.1
Aluminum Rolling	9.8	10.4	11.0	11.5	12.0
Motor Vehicles	11.8	12.0	12.1	12.3	12.5
Steel Pipe & Tube	11.1	11.7	12.3	12.9	13.5
Other Metal Rolling	9.4	10.8	12.1	13.4	14.7
M.V. Parts	13.5	13.8	14.1	14.4	14.6
Smelting Refining	15.1	15.7	16.2	16.8	17.3
Iron & Steel	15.0	15.5	16.0	16.4	16.9

Table A8: Labour Force in Low-Demand Period

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	0.0	3.0	6.0	9.1	12.3
Fishing	0.0	0.6	1.2	1.7	2.2
Retail Trade	0.0	0.8	1.1	1.4	1.7
Food & Accomm.	0.0	0.8	1.1	1.4	1.7
Personal Services	0.0	3.1	3.6	3.9	4.2
Other Agri. Products	0.0	3.1	5.7	6.1	6.5
Forestry	0.0	2.9	5.9	8.9	12.0
Amusement & Rec.	0.0	3.0	6.1	8.9	9.1
Hogs & Livestock Co.	0.0	3.0	6.0	9.0	10.1
Fruits & Vegetables	0.0	3.0	6.1	9.2	9.6
Engraving	0.0	2.9	5.9	8.8	9.3
Small Grains	0.0	3.0	6.1	9.1	10.1
Sawmills	0.0	2.8	5.7	8.7	11.8
Wheat	0.0	3.0	6.0	8.9	11.2
Other Transport	0.0	2.8	5.6	8.4	11.3
Poultry	0.0	3.0	6.0	9.0	11.3
Dairy	0.0	3.0	6.1	9.1	11.6
Repair Const.	0.0	3.0	6.0	9.1	12.4
Res. Const.	0.0	2.9	5.9	9.0	12.1
Cattle	0.0	3.0	6.0	9.0	12.0
Clothing	0.0	2.9	5.9	9.0	12.1
Business Services	0.0	2.9	5.8	8.8	11.5
Knitting Mills	0.0	2.9	5.9	8.9	12.0
Wool Yarn & Cloth	0.0	2.9	5.9	8.9	12.0
Non-Res Const.	0.0	2.9	5.9	9.0	12.2
Other Yarn & Cloth	0.0	2.9	5.9	8.9	11.9
Meat Processing	0.0	2.8	5.7	8.6	11.5
Shipbuilding	0.0	2.8	5.8	8.8	11.8
Owner Dwelling	0.0	0.0	0.0	0.0	0.0
Bakery & Biscuit	0.0	2.8	5.7	8.6	11.4
Poultry Processing	0.0	2.9	5.7	8.7	11.6
Other Furniture	0.0	3.0	6.0	9.2	12.4
Other Wood	0.0	2.8	5.8	8.8	11.8
Dairy Processing	0.0	2.7	5.4	8.0	10.7
Veneer Plywood & Other	0.0	2.8	5.7	8.7	11.7
F.I.R.E.	0.0	2.7	5.4	8.1	10.9
Wholesale Trade	0.0	2.7	5.4	8.2	11.0
Boiler & Struct. Metal	0.0	2.9	5.8	8.8	11.9
Communications	0.0	2.6	5.3	7.9	10.6
Feed Industry	0.0	2.5	5.1	7.6	10.0
Architect. Metal	0.0	2.8	5.7	8.7	11.6
Other Textiles	0.0	2.8	5.7	8.6	11.6
Truck Transport.	0.0	2.7	5.5	8.2	11.0
Air Transport.	0.0	2.7	5.5	8.3	11.2
Oth Trans. & Stor.	0.0	2.7	5.5	8.2	11.0
Rail Transport.	0.0	2.7	5.5	8.3	11.2
Sport And Toy Industry	0.0	2.7	5.5	8.2	11.0
Misc. Food	0.0	2.6	5.1	7.7	10.2
Fruit Vegetables	0.0	2.7	5.4	8.1	10.7
Public Utilities	0.0	2.6	5.1	7.7	10.1
Tobacco	0.0	2.4	4.7	7.0	9.2
Misc. Manu.	0.0	2.7	5.5	8.3	11.1

Table A8: Labour Force in Low-Demand Period

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	0.0	2.8	5.7	8.6	11.6
Print & Publish	0.0	2.7	5.3	8.0	10.8
Household Chem.	0.0	2.7	5.4	8.1	10.9
Dist. & Brew.	0.0	2.6	5.2	7.8	10.3
Office Furniture	0.0	2.8	5.7	8.7	11.6
Other Mining	0.0	2.7	5.5	8.3	11.0
Agricultural M & E	0.0	2.9	5.7	8.7	11.6
Oil & Gas Wells	0.0	2.4	4.7	7.0	9.2
Pharmaceutical	0.0	2.7	5.3	8.0	10.7
Metal Stamping	0.0	2.8	5.7	8.6	11.6
Off. & Store M&E	0.0	2.7	5.4	8.1	10.8
Public Administr.	0.0	2.5	5.1	7.7	10.3
Cement & Concrete	0.0	2.7	5.4	8.1	10.8
Mix Fert.& Other Chem.	0.0	2.6	5.1	7.7	10.2
Other Non Metal Minerals	0.0	2.8	5.7	8.6	11.5
Wire	0.0	2.8	5.6	8.5	11.4
Glass	0.0	2.8	5.7	8.6	11.6
Industrial M & E	0.0	2.8	5.6	8.5	11.5
Refineries & Coal Prod	0.0	2.3	4.5	6.7	8.8
Other Metal	0.0	2.8	5.7	8.7	11.7
Health & Education	0.0	2.7	5.5	8.3	11.2
Large Elect.App.	0.0	2.7	5.4	8.2	10.9
Wire And Cable	0.0	2.7	5.5	8.2	11.0
Plastic	0.0	2.7	5.4	8.1	10.8
Aircraft & Parts	0.0	2.7	5.4	8.2	10.9
Other Paper	0.0	2.6	5.3	8.0	10.7
Wineries	0.0	2.6	5.3	7.9	10.6
Electronic Eq.	0.0	2.7	5.5	8.2	11.0
Small Elect.App.	0.0	2.7	5.5	8.2	11.0
Leather Industry	0.0	2.8	5.8	8.8	11.8
Rubber & Plastic	0.0	2.7	5.5	8.4	11.3
Industrial Chem.	0.0	2.5	5.1	7.7	10.2
Pulp & Paper	0.0	2.6	5.2	7.9	10.5
Metal Mining	0.0	2.7	5.4	8.2	10.9
Hardware & Cutlery	0.0	2.6	5.3	8.0	10.7
Other Elect. Prod.	0.0	2.7	5.5	8.4	11.3
Aluminum Rolling	0.0	2.6	5.3	8.0	10.7
Motor Vehicles	0.0	2.6	5.3	8.0	10.6
Steel Pipe & Tube	0.0	2.7	5.4	8.2	11.0
Other Metal Rolling	0.0	2.9	5.8	8.9	12.0
M.V. Parts	0.0	2.8	5.7	8.5	11.4
Smelting Refining	0.0	2.5	5.1	7.7	10.4
Iron & Steel	0.0	2.6	5.3	8.0	10.9

Table A9: Unemployment

(percentage point change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	-11.1	-12.1	-13.3	-14.4	-15.6
Fishing	-13.4	-13.4	-13.4	-13.4	-13.4
Retail Trade	-5.4	-5.6	-5.6	-5.6	-5.6
Food & Accomm.	-5.6	-5.9	-5.9	-5.9	-5.9
Personal Services	-5.2	-6.9	-7.0	-7.0	-7.0
Other Agri. Products	-5.7	-7.0	-8.1	-8.1	-8.1
Forestry	-3.2	-4.2	-5.2	-6.3	-7.4
Amusement & Rec.	-2.8	-3.9	-5.1	-6.2	-6.2
Hogs & Livestock Co.	-4.6	-5.7	-6.8	-7.9	-8.1
Fruits & Vegetables	-4.6	-5.7	-6.9	-8.1	-8.1
Engraving	-2.3	-3.3	-4.5	-5.6	-5.6
Small Grains	-4.4	-5.6	-6.7	-7.9	-8.1
Sawmills	-1.7	-2.4	-3.1	-3.9	-4.7
Wheat	-4.1	-5.2	-6.3	-7.4	-8.1
Other Transport	-2.2	-3.3	-4.4	-5.5	-6.6
Poultry	-4.0	-5.1	-6.2	-7.3	-8.1
Dairy	-3.7	-4.8	-6.0	-7.2	-8.1
Repair Const.	-0.7	-1.8	-3.1	-4.3	-5.6
Res. Const.	-0.7	-1.8	-3.0	-4.2	-5.5
Cattle	-3.5	-4.6	-5.7	-6.8	-7.9
Clothing	-1.0	-2.0	-3.0	-4.1	-5.1
Business Services	-0.7	-1.8	-3.0	-4.3	-5.4
Knitting Mills	-0.9	-1.9	-2.9	-3.9	-4.9
Wool Yarn & Cloth	-1.3	-2.2	-3.0	-3.9	-4.8
Non-Res Const.	-0.8	-1.8	-2.9	-4.0	-5.1
Other Yarn & Cloth	-1.2	-2.0	-2.8	-3.6	-4.5
Meat Processing	-0.3	-1.2	-2.2	-3.1	-4.1
Shipbuilding	0.0	-1.1	-2.1	-3.3	-4.4
Owner Dwelling	0.0	0.0	0.0	0.0	0.0
Bakery & Biscuit	-0.3	-1.3	-2.4	-3.4	-4.4
Poultry Processing	0.0	-1.0	-1.9	-3.0	-4.0
Other Furniture	-0.4	-1.2	-2.1	-3.0	-3.8
Other Wood	-0.4	-1.1	-1.9	-2.7	-3.4
Dairy Processing	0.5	-0.3	-1.1	-1.8	-2.6
Veneer Plywood & Other	0.0	-0.8	-1.6	-2.5	-3.3
F.I.R.E.	0.2	-0.7	-1.7	-2.7	-3.7
Wholesale Trade	0.4	-0.6	-1.7	-2.8	-3.9
Boiler & Struct. Metal	0.1	-0.8	-1.7	-2.6	-3.6
Communications	0.5	-0.5	-1.4	-2.4	-3.4
Feed Industry	0.8	0.1	-0.7	-1.4	-2.1
Architect. Metal	0.4	-0.5	-1.5	-2.4	-3.4
Other Textiles	0.4	-0.4	-1.3	-2.1	-3.0
Truck Transport.	0.7	-0.1	-1.0	-1.9	-2.8
Air Transport.	0.8	-0.1	-1.1	-2.1	-3.1
Oth Trans. & Stor.	0.8	-0.1	-1.0	-1.9	-2.8
Rail Transport.	0.9	-0.1	-1.0	-2.0	-3.0
Sport And Toy Industry	0.7	-0.2	-1.1	-2.1	-3.0
Misc. Food	1.2	0.5	-0.3	-1.0	-1.7
Fruit Vegetables	0.9	0.2	-0.6	-1.3	-2.0
Public Utilities	1.4	0.7	-0.1	-0.8	-1.5
Tobacco	1.9	1.2	0.5	-0.1	-0.7
Misc. Manu.	0.8	-0.1	-1.0	-1.9	-2.9

Table A9: Unemployment

(percentage point change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	0.9	0.1	-0.7	-1.6	-2.5
Print & Publish	0.9	0.1	-0.8	-1.7	-2.6
Household Chem.	0.5	-0.3	-1.0	-1.8	-2.6
Dist. & Brew.	1.4	0.7	0.0	-0.8	-1.4
Office Furniture	0.8	0.1	-0.7	-1.4	-2.2
Other Mining	0.9	0.2	-0.5	-1.2	-1.9
Agricultural M & E	0.9	0.2	-0.6	-1.3	-2.0
Oil & Gas Wells	2.1	1.5	1.0	0.4	-0.1
Pharmaceutical	0.9	0.2	-0.5	-1.2	-1.9
Metal Stamping	1.0	0.2	-0.7	-1.6	-2.4
Off. & Store M&E	1.3	0.5	-0.3	-1.1	-1.9
Public Administr.	1.8	0.8	-0.2	1.3	-2.4
Cement & Concrete	1.1	0.4	-0.3	-1.0	-1.8
Mix Fert.& Other Chem.	1.4	0.7	-0.1	-0.8	-1.5
Other Non Metal Minerals	0.9	0.2	-0.5	-1.2	-1.9
Wire	1.2	0.4	-0.5	-1.4	-2.3
Glass	1.0	0.3	-0.5	-1.2	-2.0
Industrial M & E	1.1	0.4	-0.4	-1.2	-2.0
Refineries & Coal Prod	2.3	1.6	0.9	0.2	-0.5
Other Metal	1.2	0.4	-0.4	-1.2	-2.1
Health & Education	1.6	0.8	0.0	-0.9	-1.8
Large Elect.App.	1.6	0.8	0.0	-0.8	-1.5
Wire And Cable	1.5	0.8	0.1	-0.6	-1.3
Plastic	1.4	0.8	0.2	-0.4	-1.1
Aircraft & Parts	1.8	1.0	0.2	-0.7	-1.5
Other Paper	1.7	1.0	0.3	-0.4	-1.1
Wineries	1.7	1.1	0.4	-0.2	-0.9
Electronic Eq.	1.6	0.9	0.2	-0.5	-1.2
Small Elect.App.	1.7	1.0	0.3	-0.4	-1.2
Leather Industry	1.1	0.6	0.0	-0.6	-1.1
Rubber & Plastic	1.7	1.0	0.4	-0.3	-1.1
Industrial Chem.	2.2	1.6	1.0	0.4	-0.1
Pulp & Paper	2.0	1.5	0.9	0.3	-0.3
Metal Mining	1.9	1.3	0.7	0.0	-0.6
Hardware & Cutlery	2.4	1.8	1.0	0.3	-0.5
Other Elect. Prod.	2.1	1.5	0.9	0.3	-0.4
Aluminum Rolling	2.7	2.1	1.5	0.9	0.4
Motor Vehicles	1.7	1.3	1.0	0.6	0.3
Steel Pipe & Tube	2.3	1.8	1.4	0.9	0.5
Other Metal Rolling	2.7	2.2	1.7	1.2	0.7
M.V. Parts	2.4	2.0	1.5	1.0	0.6
Smelting Refining	3.1	2.7	2.2	1.8	1.4
Iron & Steel	3.1	2.6	2.2	1.7	1.2

Table A10: Industry Wages

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Fish Processing	10.9	9.8	8.7	7.7	6.6
Fishing	6.5	-12.7	-13.0	-13.1	-13.2
Retail Trade	10.2	-11.6	-12.8	-13.2	-13.3
Food & Accomm.	10.8	-11.2	-12.6	-13.0	-13.2
Personal Services	9.8	8.7	-4.7	-8.6	-10.3
Other Agri. Products	9.0	7.7	4.3	-3.5	-6.9
Forestry	4.8	4.1	3.3	2.6	1.8
Amusement & Rec.	5.7	4.4	3.1	1.2	-4.2
Hogs & Livestock Co.	7.2	5.7	4.3	2.9	-1.6
Fruits & Vegetables	8.4	6.9	5.4	4.0	-1.9
Engraving	2.9	2.3	1.6	0.6	-4.3
Small Grains	8.1	6.6	5.1	3.6	-1.2
Sawmills	-0.9	-1.3	-1.6	-2.0	-2.4
Wheat	7.6	6.0	4.4	2.9	0.3
Other Transport	2.7	1.8	0.9	0.0	-0.9
Poultry	7.7	6.1	4.5	3.0	0.5
Dairy	8.7	7.0	5.3	3.7	1.4
Repair Const.	3.3	2.7	2.1	1.5	0.9
Res. Const.	3.2	2.4	1.7	0.9	0.2
Cattle	8.5	6.7	5.0	3.4	1.8
Clothing	2.2	1.4	0.7	0.0	-0.7
Business Services	1.9	1.3	0.7	0.1	-1.2
Knitting Mills	2.2	1.4	0.6	-0.2	-0.9
Wool Yarn & Cloth	1.8	1.2	0.5	-0.1	-0.8
Non-Res Const.	3.0	2.4	1.7	1.0	0.3
Other Yarn & Cloth	1.7	1.0	0.3	-0.4	-1.1
Meat Processing	-0.1	-0.8	-1.6	-2.3	-3.1
Shipbuilding	0.8	0.3	-0.2	-0.7	-1.2
Owner Dwelling	0.0	0.0	0.0	0.0	0.0
Bakery & Biscuit	1.5	0.5	-0.4	-1.3	-2.2
Poultry Processing	0.3	-0.5	-1.2	-2.0	-2.8
Other Furniture	1.0	0.4	-0.1	-0.6	-1.1
Other Wood	-0.4	-0.8	-1.2	-1.7	-2.1
Dairy Processing	-1.3	-2.2	-3.1	-3.9	-4.8
Veneer Plywood & Other	-0.1	-0.7	-1.3	-1.8	-2.4
F.I.R.E.	0.4	-0.5	-1.5	-2.4	-3.3
Wholesale Trade	0.2	-0.6	-1.3	-2.0	-2.7
Boiler & Struct. Metal	0.9	0.2	-0.4	-1.1	-1.8
Communications	-0.2	-1.2	-2.1	-3.0	-3.9
Feed Industry	-3.6	-4.3	-5.0	-5.7	-6.4
Architect. Metal	0.1	-0.6	-1.2	-1.9	-2.6
Other Textiles	-0.5	-1.1	-1.7	-2.3	-2.9
Truck Transport.	-1.1	-1.8	-2.6	-3.3	-4.1
Air Transport.	-1.3	-1.9	-2.4	-3.0	-3.6
Oth Trans. & Stor.	-1.1	-1.8	-2.5	-3.3	-4.0
Rail Transport.	-1.3	-1.9	-2.4	-3.0	-3.6
Sport And Toy Industry	-0.5	-1.2	-2.0	-2.7	-3.4
Misc. Food	-2.9	-3.7	-4.5	-5.3	-6.1
Fruit Vegetables	-1.8	-2.6	-3.4	-4.2	-4.9
Public Utilities	-2.4	-3.3	-4.2	-5.1	-6.0
Tobacco	-4.5	-5.4	-6.2	-7.0	-7.7
Misc. Manu.	-0.5	-1.2	-1.8	-2.4	-3.0

Table A10: Industry Wages

(per cent change shock minus control)

	Elasticity of substitution between labour and the fixed factor				
	0	**0.0125**	**0.025**	**0.0375**	**0.05**
Footwear Industry	-1.3	-1.8	-2.3	-2.9	-3.4
Print & Publish	-0.6	-1.3	-2.1	-2.8	-3.5
Household Chem.	0.0	-0.7	-1.4	-2.1	-2.8
Dist. & Brew.	-2.6	-3.4	-4.2	-5.0	-5.8
Office Furniture	-1.3	-1.9	-2.5	-3.1	-3.6
Other Mining	-1.3	-1.9	-2.6	-3.2	-3.9
Agricultural M & E	-1.1	-1.8	-2.4	-3.0	-3.7
Oil & Gas Wells	-5.3	-6.1	-6.8	-7.4	-8.0
Pharmaceutical	-0.7	-1.5	-2.2	-3.0	-3.8
Metal Stamping	0.0	-0.7	-1.4	-2.1	-2.7
Off. & Store M&E	-2.0	-2.7	-3.4	-4.1	-4.7
Public Administr.	-2.6	-3.1	-3.6	-4.1	-4.6
Cement & Concrete	-2.1	-2.7	-3.4	-4.0	-4.7
Mix Fert.& Other Chem.	-1.8	-2.5	-3.3	-4.0	-4.7
Other Non Metal Minerals	-0.6	-1.3	-1.9	-2.5	-3.1
Wire	-0.9	-1.4	-2.0	-2.6	-3.1
Glass	-0.8	-1.3	-1.8	-2.4	-2.9
Industrial M & E	-0.9	-1.5	-2.1	-2.7	-3.2
Refineries & Coal Prod	-4.1	-4.9	-5.7	-6.4	-7.1
Other Metal	-0.2	-0.7	-1.2	-1.7	-2.2
Health & Education	-3.1	-3.5	-4.0	-4.4	-4.8
Large Elect.App.	-1.8	-2.5	-3.1	-3.7	-4.4
Wire And Cable	-1.5	-2.2	-2.9	-3.6	-4.2
Plastic	-0.9	-1.6	-2.3	-3.0	-3.7
Aircraft & Parts	-1.6	-2.2	-2.8	-3.3	-3.9
Other Paper	-3.5	-4.0	-4.6	-5.1	-5.6
Wineries	-2.4	-3.1	-3.7	-4.4	-5.0
Electronic Eq.	-1.7	-2.3	-2.9	-3.5	-4.1
Small Elect.App.	-1.7	-2.3	-2.9	-3.4	-4.0
Leather Industry	-1.1	-1.5	-1.8	-2.2	-2.6
Rubber & Plastic	-1.5	-2.0	-2.5	-3.0	-3.5
Industrial Chem.	-2.2	-2.9	-3.5	-4.1	-4.7
Pulp & Paper	-4.5	-5.0	-5.5	-6.0	-6.5
Metal Mining	-0.6	-1.3	-2.0	-2.7	-3.3
Hardware & Cutlery	-3.1	-3.6	-4.1	-4.5	-5.0
Other Elect. Prod.	-1.4	-1.9	-2.4	-2.9	-3.3
Aluminum Rolling	-3.8	-4.4	-4.9	-5.5	-6.0
Motor Vehicles	-9.4	-9.7	-10.0	-10.3	-10.5
Steel Pipe & Tube	-6.2	-6.6	-7.0	-7.3	-7.7
Other Metal Rolling	-0.8	-1.1	-1.5	-1.9	-2.2
M.V. Parts	-6.4	-6.8	-7.1	-7.5	-7.9
Smelting Refining	-7.4	-7.7	-8.0	-8.3	-8.6
Iron & Steel	-6.6	-6.8	-7.0	-7.2	-7.5

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